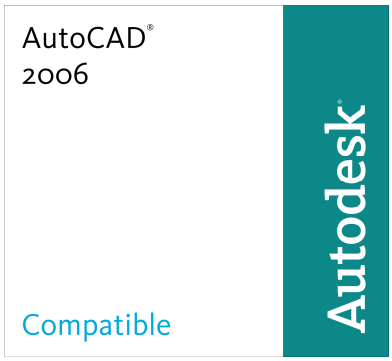
User's Manual

GTXRaster CAD® Series V9.1

GTX Corporation



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Release Version 9.1

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Table of Contents

Table of Contents 2

Introduction 11

The GTXRaster CAD Series Version 9.1 11

GTXRaster Tools 11

GTXRaster CAD 12

GTXRaster R2V 12

GTXRaster CAD *PLUS* 12

Mastering the GTXRaster CAD Series 13

User's Manual 13

Other Sources of Help 13

Technical Support 13

Installing the Software 14

The Appendix 14

AutoCAD Compatibility 14

Software Configuration 14

Raster Files 15

File Format 15

Image Size 15

Resolution 15

Orientation 15

Installation 17

System Requirements 17

Installing the Software 17

Running SETUP 18

Readme 20

Program Groups/Folders 20

Install HASP Device Drivers 21

HASP Install 21

Single-user licenses 23

Network license: 23

Authorize Your HASP Key 24
Authorization Instructions 24
Network License Management 26
Establishing Network License Servers 27
Check Profile Paths 27
Adding the GTXRaster CAD Series to an Existing Profile 28
Uninstalling the Software 29
Removing the GTX Application Files 29
Using the GTXRaster CAD Series 30
The Purpose of This Section 30
Raster and Vector 30
AutoCAD 2006 and Raster Images 31
What Does GTX Add to AutoCAD? 31
Product Functionality 31
Loading Raster Images Into AutoCAD 31
Scaling and Aligning Attached Raster Images 32
Orienting and Rotating Image Entities 33
Creating New Raster Images 34
Cropping Raster Data 35
Modifying Images 35
Cutting and Pasting Raster 35
Converting Between Raster and Vector 37
Vector-to-Raster Commands 37
Raster-to-Vector Commands 38
Intelligent Character Recognition 38
Vector Cleanup 38
Snapping to Raster 38
Saving Images 39
GTXRaster CAD Series Performance Factors 39
Automatic Save Interval 39
Swap Space 39

Aerial View 40
Current View/Zoom 40
Image Quality 40
Multiple Images 40
Working with Color Images 40
Getting Started 44
Using the Tutorials 44
Following the Lessons 44
Standardizing Your Environment for the Tutorials 44
Editing a Raster File 44
Lesson 1: Raster Cleanup 45
Load a Raster File 46
Attach an Image Within AutoCAD 46
Rename an Attached Image 47
Enhance the Raster Image 47
Use **gDESKEW** to Straighten the Drawing 47
Use **gCROP** to Clean Up Borders 49
Use **gSPECKL** to Remove Speckles 49
Save Your Changes 51
Edit Raster Geometry 51
Use **gCOPY** to Copy Raster Geometry 51
Use **gERASE** to Remove Raster Geometry 52
Use **gSCALE** to Resize Raster Geometry 53
Use **gRASTER** to Rasterize Vector Geometry 53
Use **gCUT** to Save Selected Raster Geometry 54
Replacing Raster Text with Vector Text 55
Use **gPASTE** to Insert Cut Raster Geometry 55
Use **gCOPY** to Copy Raster Geometry 56
Use **gROTATE** to Rotate Raster Geometry 57
End the Session 58
Loading Your New Drawing 58

What You've Learned 58
Lesson 2 : Raster Revision 59
Load a Raster File 59
Renaming the Raster File 60
Scaling the Image 60
Enhance the Raster Image 61
Use **gDESKEW** to Straighten the Drawing 61
Edit Raster Geometry 62
Use **gCHANGE** to Modify a Circle 62
Use **gCHANGE** to Modify a Line 63
Converting Raster to Vector 65
Use the "Edge" Raster Snap to Draw a Solid 65
Use the "Nearest" Raster Snap to Draw a Polyline 66
Use **gTRACE** to Convert a Raster Line to Vector 67
Use **gRUB** to Erase all Raster Underlying Vector Entities 67
Combining Raster Drawings 67
Use **gPASTE** to Insert a Raster Image 67
Making a Frame 68
Save the Drawing 69
Loading Hybrid Drawings 69
What You've Learned 70
Lesson 3: Raster to Vector 70
Summary of GTX Conversion Commands: 71
Loading a Raster File 71
Use **gCONVRT** to Convert Raster to Vector 72
Converting Raster Text to AutoCAD Text Entities 73
Using **gTCONFIG** to Configure the Text Recognition 73
Use **gTCONVRT** to Recognize Raster Text 77
Converting Dashed Raster Data 78
What You've Learned 79
Lesson 4: Using Advanced Conversion Features 80

Prepare the drawing 80
What You've Learned 82
Lesson 5: Using Intelligent Character Recognition 84
Preparation 84
Configuring Text Recognition 84
What You've Learned 87
Command Reference 88
Command Overview 88
Raster Picking Options 94
Raster Object Snapping Options 96
Command Definitions 97
gACLEAN 98
gACTIVE (Active Image) 99
gADESKEW 101
gARC 102

gAUTOSNAP 108
gBITONAL 110
gBURN 112
gCALIKE 117
gCELEV 118
gCHANGE 119
gCHGLAY 122
gCIRCLE 123
gCLEANIOP 124
gCONCEN 125

gCONVRT 126
gCOPY 131
gCREATE 134
gCROP 135
gCUT 136
gDESKEW 139
gECONVRT 143
gEDGE 145
gERASE 146
gFRZLAY 147
gHELP 148
gINACTIVE 151
gINFO 152
gINVERT 154
gISOLAY 155
gJOIN 156
gLINE 157
gMIRROR 158
gMOVE 159
gOFFSET 162
gOSR 164
gPASTE 165

gRAHEAD 171
gRASTER 172
gREDUCE 178
gREFLCT 180
gRELIMIT 181
gRESIZE 182
gROTATE 183
gRUB 187
gSAVE 188
gSCALE 190
gSEPARATE 193
gSETLAY 198
gSMOOTH 199
gSPECKL 203
gTCONFIG 205
gTCONVRT 211
gTRACE 215
gTRAIN 218
gTURN 222
gVECTOR 223
gVSKEW 224
gWARP 225

Appendix 1: Glossary of Terms 228

Appendix 2: Configuration 231

Here is a standard configuration file: 231

REM * GTX Configuration * 231

REM ** Use “REM” or “rem” for comment lines, blank lines are ok. ** 231

REM **Defines the default path for saving raster files.** 231

REM **Used with gCreate and color images when gActivated.** 231

REM **Defines the width of rasterized vector objects.** 232

REM **Yes option creates a backup of the original raster file.** 232

REM **Yes option saves the vector entity when doing Gburn or Graster.** 232

REM **Defines the Dot Per Inch resolution within the raster limits.** 232

REM **Sets the subformat to be used when saving TIFF files.** 232

REM * Text Configuration * 232

REM ** 0 means touching character recognition is OFF, 1 means ON 233

REM ** 0 means word mode CR, 1 means character mode CR 233

REM ** Character similarity file for word recognition 233

REM ** dictionary file for word recognition 233

REM ** sets the default GAP JUMP size 233

REM ** sets the layer name to be created during hatch recognition 233

REM ** sets the layer name to be created during linestyle recognition 233

REM * Line Width Configuration * 233

REM **Product level. Settings include RCAD, RCADPLUS, RTOOLS, R2V.** 234

REM **If set to 1 all plines will be rasterized as 1 pixel wide.** 234

REM DEFAULT, JAPAN_NEC, JAPAN_IBM.** 234

Hasp_Type=DEFAULT 234

REM ** Defines the layer color for the layer named in the 234

REM ** editing raster images. This will cause more overhead to keep * 235

3P_APP_SAVING=NO 235

GACTIVE_ON_GATTACH=YES 235

REM **Allows saving raster files over Novell 4.x 235

REM **Allows saving raster files over Novell 3.x 235

REM ** Keep the following setting at 'YES' to prevent 235
Customizing 235
Configuration Entry Descriptions 236
Basic Configuration Parameters 236
Text Configuration Parameters 238
Raster-to-Vector Conversion Parameters 240
Other Parameters 240
Line Width Configuration 242
Appendix 3: Raster File Formats 243
Rastrans Raster Format Translator V5.0 245
Windows GUI Version 245
Rastrans main screen 245
Input Files List 245
DOS Version of GTX Rastrans 246
Usage: 247
Appendix 4: GTX OSR V5.0 248
System Requirements 248
Using GTX OSR 248
Conversion Process 248
Main Screen Layout 249
Import Files 249
Raster File Formats 250
Basic Pane 252
Advanced Pane 255
Vector Entity Translation 257
Command Line Version of OSR 259
Process Flow 259
Configuration Files 260
Command-Line Entries 266
Index 269

Introduction

The GTXRaster CAD Series Version 9.1

This manual describes the installation and use of Version 9.1 of the GTXRaster CAD Series. The Series consists of four software products - GTXRaster Tools, GTXRaster CAD, GTXRaster CAD *PLUS* and GTXRaster R2V. Each provides different levels of raster cleanup, editing and conversion capabilities.

GTXRaster Tools lets you clean up binary (black and white) raster attached within AutoCAD. GTXRaster CAD lets you thoroughly edit binary raster. GTXRaster CAD *PLUS* gives you the power to convert binary raster into AutoCAD vector entities. GTXRaster R2V can complement other third-party imaging tools with the clean-up tools in GTXRaster Tools and the conversion abilities of GTXRaster CAD *PLUS* (GTXRaster R2V does not include raster editing functions).

	Product Functionality				
Product Level	**Raster Cleanup**	**Raster Editing**	**Conversion**	**Character Recognition**	**Batch Conversion**
GTXRaster Tools	X				
GTXRaster CAD	X	X			
GTXRaster R2V	X		X	X	X
GTXRaster CAD *PLUS*	X	X	X	X	X

GTXRaster Tools

GTXRaster Tools provides capability to efficiently **clean** and **enhance** raster images. It includes the following features:

- **Raster Snapping** that emulates AutoCAD object snapping to raster data.
- Integration with third party **document managers** and raster applications, using industry standard raster formats
- **Intelligent Object Picking** (IOP) makes selection of raster objects as easy as handling CAD entities.
- **Improve drawing quality** by using image enhancement to clean, deskew, scale, rotate and remove speckles.

- **Output changes** to a variety of printers and plotters as a hybrid (raster and vector) or full raster drawing.
- **Intelligent Enhancement** helps improve drawing quality and legibility while reducing raster file storage requirements 20-30% over already compressed formats.

GTXRaster CAD

GTXRaster CAD includes all the raster clean-up tools in GTXRaster Tools. In addition, it provides **Raster Editing** functionality for editing raster data in the same manner as vector data. This extended functionality includes:

Raster Edit commands treat scanned shapes as vector geometry.

More Raster Snap modes make it easier to edit raster geometry.

Intelligent Object Picking for selection of complex raster data and to preserve raster intersections instead of creating gaps.

Selective Vectorization helps you trace raster with AutoCAD vector entities.

GTXRaster R2V

GTXRaster R2V combines the raster cleanup from GTXRaster Tools and the raster-to-vector conversion from GTXRaster CAD *PLUS* without the GTXRaster CAD raster editing and extended raster snaps. This product adds GTX's unique raster clean up and conversion features to any existing AutoCAD-based raster editing applications.

A powerful batch-conversion program, GTX OSR®, is included with GTXRaster R2V. For more information, see Appendix 4: GTX OSR V5.0 on page 248.

GTXRaster CAD *PLUS*

GTXRaster CAD *PLUS* includes all the functionality of GTXRaster Tools and GTXRaster CAD. It also provides powerful geometry and text conversion tools for transforming raster images into intelligent AutoCAD drawings.

Raster-to-Vector Conversion converts selected raster data into AutoCAD entities.

The **Intelligent Character Recognition** (ICR) quickly converts raster text, typically 20% of engineering drawings. ICR is different than OCR (optical character recognition) because of its unique training capability that allows you to train the software to recognize new fonts or custom lettering styles. **Dictionary look-up** and **pattern matching** make ICR perfect for recognizing the complicated text, such as part numbers.

A powerful batch-conversion program, GTX OSR®, is included with GTXRaster CAD *PLUS*.

Mastering the GTXRaster CAD Series

User's Manual

You can use this manual to learn about the software in several ways:

- **Using the GTXRaster CAD Series** provides an overview of working with raster in AutoCAD 2006 and general principles about using GTX software (Page 30).
- **Getting Started** demonstrates features and functions of the software in step-by-step lessons (Page 44).
- The **Command Reference** describes each GTXRaster CAD command and feature in an alphabetical list (Page 88).
- Use the **Index** to look up any term for which you need more information.

Other Sources of Help

- Use the Windows Help file: You can launch this from the GTX program group help icon, by typing **gHelp** from the command prompt, by selecting *HELP* from the GTX RCAD pull-down menu, or by pressing **F1** at a GTX command-line prompt. These execute our online help file, rcadwin.chm, from the GTX program folder.
- The GTX Web site at http://www.gtx.com contains product information, frequently asked questions (FAQ) and technical notes.

Technical Support

- Always contact your authorized reseller first for technical support issues.
- A maintenance agreement is available for purchase from GTX Corporation. Contact your GTX reseller for details.

- E-mail questions to GTX at: support@gtx.com.

Installing the Software

The Installation section describes how to install and configure all levels of the GTXRaster CAD Series. The Security section describes how to authorize your software license with the HASP key attached to your computer's parallel or USB port.

The Appendix

- **Glossary of Terms** - Defines special terms used in this manual which are printed in **boldface**.
- **Configuration File** - Describes the configuration file and its parameters.
- **Raster Formats** - Lists supported raster import and export formats.
- **GTX OSR V5.0** - GTX OSR (Open System Recognition) V5.0, A Stand-alone batch conversion program

AutoCAD Compatibility

The GTXRaster CAD Series runs inside AutoCAD, so all keyboard controls work the same as AutoCAD:

- The **[RETURN]** and **[Space]** key can be used interchangeably to end a command sequence or close a selection.
- By the default AutoCAD configuration, **[Esc]** cancels commands.
- GTX commands allow transparent commands to run while another command is running (i.e., a **Transparent Zoom** is done by typing an apostrophe before the command name: ZOOM or Z).

Software Configuration

The GTXRaster CAD Series receives many of its default values from *GTXRAST.CFG*. This file can be edited with any ASCII text editor (such as Notepad or WordPad).

Raster Files

The raster files you will use with the GTXRaster CAD Series are created with a scanner. Properly calibrating it and following its instructions will generate better images. The better the image, the less cleanup is necessary.

File Format

For a list of accepted raster file formats, see Appendix A3, **Raster Formats**, on page 243.

Image Size

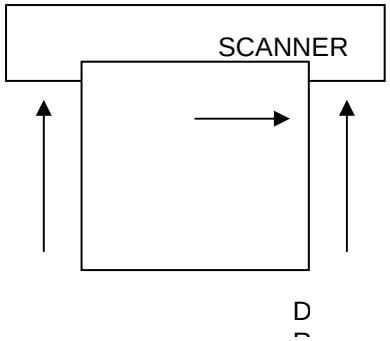
Some raster file formats allow a maximum size of 32,768 (32K) **pixels** in both the X and Y directions. If your drawing limits are large, be sure your pixels are also large. For example, at 400 **DPI**, 32K pixels equals approximately 80 inches. The maximum raster limits are also restricted by the available memory and your system's swap file size.

Resolution

If your scanner outputs high-resolution files, you can set a lower resolution in the GTXRAST.CFG file to minimize memory requirements. Raster files can require more memory than CAD files and higher resolutions require more memory.

Orientation

The image orientation depends on the scanning orientation. Some graphics programs automatically rotate the image –90 degrees when loading and saving to compensate for the fact that horizontal drawings are usually scanned **sideways** or short side first. Such files are oriented differently in GTXRaster CAD than in the other graphics programs unless loaded with a compensating rotation using the **RefRotate** configuration parameter.



The image orientation depends on the scanning orientation. Some graphics programs automatically compensate for sideways scanned images by rotating the display of images 90° counter-clockwise. Earlier versions of GTXRaster CAD performed this adjustment upon loading a raster image. In versions 4.0 and earlier, GTXRaster CAD created a .REF file to designate each raster file's insertion point and scale.

Because AutoCAD does perform an adjusting rotation automatically, GTXRaster CAD V9.1 makes importing raster files from earlier versions using the **RefRotate** parameter. Upon attaching (loading) an image accompanied by a .REF file, GTXRaster CAD will make the adjusting rotation as long as the RefRotate parameter is set correctly. (See Appendix A2, Configuration).

Installation

System Requirements

Minimum requirements are the same as AutoCAD, but more RAM and virtual memory are definitely recommended.

CPU	Pentium II or equivalent
Operating System	Windows 2000, XP
Drive space	30 MB free hard disk space
Virtual memory	512 MB swap file
Memory	256 MB RAM
Display	1024 X 768 or better
AutoCAD version	AutoCAD 2006

Software or Hardware Licensing

Starting with GTXRaster CAD® Series, Version 9.1 for AutoCAD® 2006, GTX Corporation is including the option of either Hardware (HASP Dongle) licensing or Software (Macrovision® **FLEX**ENABLED™) Software licensing.

This manual details the hardware locked (HASP dongle) installation. Also, for more details of HASP hardware installation see the **START.chm** help file.

For details on installing the Macrovision® **FLEX**ENABLED**™** software locking refer to the **GTX_Flex_Licensing.chm** help file.

Installing the Software

Decide which AutoCAD profile you want to use first. SETUP uses the existing AutoCAD profile to create a new GTX profile. This means that you will need to have run AutoCAD at least once before installing GTXRaster CAD. To install your software:

Installation Steps	
1.	Run SETUP from GTX CD
2.	Read README.PDF and other files for recent changes to the installation!
3.	Run HDD32.EXE. This sets up security key files on your system. If upgrading, do this once to remove the old files and again to install the new ones!
4.	Attach HASP security key to your computer's parallel or USB port.
5.	Run CUSTOMER.EXE to get your HASP key ID.
6.	Complete Authorization Form and FAX it to GTX.
7.	If using a network license, establish NetHASP network license.

Note: ***For installations performed under Administrative login, but not visible under a user's login, rerun the RCAD91\RCAD91.exe from the CD ROM, while logged in as the user, and select Update Registry'.***

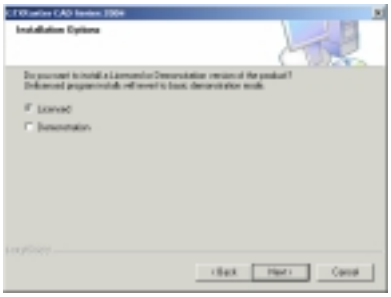
Running SETUP

1. Insert the installation CD.

2. If your AutoRUN is active on your system, a dialog will appear. Select **GTXRaster CAD Series**, and then under **AutoCAD 2006**, select **Install**.

3. If AutoRUN is not active, the dialog will not appear when you inserted the CD. Run *D:\RCAD91\SETUP.EXE* (Assuming D: is your CD-ROM drive) to start the installation.

4. Click **OK**.



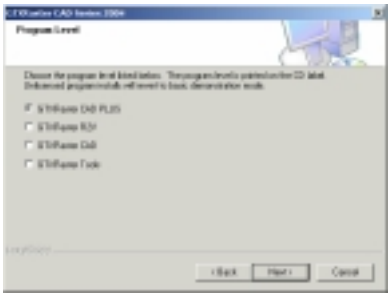
SETUP will initialize and after a few seconds the software license agreement will appear.

5. Specify if you are installing a demonstration or a licensed version. This sets the **DEMOMODE** configuration parameter in the GTXRaster CAD configuration file, *gtxrast.cfg*.

6. Select **Licensed** and **Next** if you are installing the product of which you have purchased a license.

NOTE ***If you purchased this product, select LICENSED. If you are installing a demonstration version, select DEMONSTRATION.***

7. SETUP prompts you for the **Product Level** (the actual name of the software you purchased). Select the appropriate product level name and select **Next**. This sets the **ProductLevel=** configuration parameter in *gtxrast.cfg*.



NOTE ***If you select the wrong product level, then your software will not run correctly! Be sure to enter the correct product name – GTXRaster Tools, GTXRaster CAD, GTXRaster R2V or GTXRaster CAD PLUS.***

8. The **Choose Destination Location** dialog appears. To install the program in a custom directory, select **Browse** to establish the new destination. Once the correct Destination Directory is displayed, Select **Next**.

9. If you are installing as the administrator, SETUP will create a common program folder, which will be visible to any users logged in on the computer.

10. SETUP installs the program files from the installation CD or disks.

11. Setup prompts you to choose a profile on which to base the new GTXRaster CAD Series profile. The next prompt lets you give your profile a custom name. If you are intending on running GTXRaster

R2V with another third-party AutoCAD application, base the GTX profile on that application's existing profile.

12. Setup prompts you to choose the program folder in which the program icons will appear within the start menu.

13. After running SETUP, you will need to run *HINST.BAT* and *CUSTOMER.EXE* (available from the GTXRaster CAD program folder). Read *README.PDF*.

Readme

README.PDF contains any changes to the installation and configuration process not yet documented by this manual.

Program Groups/Folders

SETUP creates a GTXRaster CAD V9.1 program folder containing the icons used for running GTXRaster CAD and its accompanying programs. The GTXRaster CAD V9.1 program folder contains a folder for GTX OSR and another one for HASP License containing icons for setting up and configuring your HASP license.

Software Licensing

Starting with GTXRaster CAD® Series, Version 9.1 for AutoCAD® 2006, GTX Corporation is introducing the Macrovision® **FLEX**ENABLED™ software licensing product alternative to the Aladdin hardware lock license. As with hardware lock licensed versions, GTXRaster CAD Series V9.1 is available in a single user standalone version and a networked floating license multiple user version.

Installation of a standalone software licensed GTXRaster CAD Series V9.1 is dedicated to a particular personal computer, where as a hardware lock licensed installation is portable from computer to computer. The networked floating software license is distributed from a License Server System, which is dedicated to a particular computer. Access to a floating GTX software license is available to any personal computer which shares a common network with the License Server System.

This manual covers details of the hardware locked (HASP dongle) installation. For details on installing the Macrovision **FLEX**ENABLED software locking refer to the **GTX_Flex_Licensing.chm** help file

Install HASP Hardware Device Drivers

HINST.BAT runs *HDD32.EXE*. Run this program on each machine running GTXRaster CAD series software.

HDD32.EXE installs HASP device drivers, which interface between the GTX software and the HASP security key. The GTXRaster CAD Series requires the HASP drivers to be installed before it can find the HASP.

HDD32.EXE can be run using the **HINSTALL** icon, located in the GTX program group under the **HASP License** subfolder. For detailed instructions read *HDD.HLP* in the LICENSE subdirectory under the GTX *LICENSE* directory.

HASP Install

If you have not installed earlier versions of GTXRaster CAD software, use *HDD32.EXE* to install the HASP drivers on your system.

You must be logged in as the administrator to run *HDD32.EXE*.

1. Run HDD32.EXE
2. A dialog will appear asking for Language – select **U.S. English** then **OK**
3. A Welcome screen will appears. Select **NEXT**.

The **Installation Status** screen will show the version and status of any preexisting HASP license managers. Select **Next**.

4. The system will then install the HASP driver. Click **FINISH** at the Finished screen.

ADDITIONAL HASP HELP

If you encounter problems using *HDD32.EXE*, please refer to the HASP documentation provided in the *License* subdirectory of the GTX program directory. These include:

File	Description
Customer.hlp	Help in operating CUSTOMER.EXE for key authorization
Hdd.hlp	Help in running HDD32.EXE
Nhiniwiz.hlp	Help in using the NetHASP Wizard to generate an .INI file
Nhsrvw32.hlp	Help in using the NetHASP Server software
Start.chm	General information on NetHASP.

Note: ***The HASP device drivers and other HASP-related software included with this product is periodically updated to accommodate changes in the Windows operating system. If you encounter problems after installing a service pack or changing operating systems, you may wish to check the GTX website to determine whether updates have been issued for these drivers.***

Install the HASP Key

Single-user licenses

GTX single-user keys (**MemoHASPs**) are white. GTX-Vibrant Combo single-user keys are blue on one side and black on the other. These are no longer shipped with the latest version of the GTXRaster CAD series, but may still be used with an upgrade package.

Plug your single-user MemoHASP key into your computer's parallel or USB port.

Network license:

GTX network keys (NetHASPs) are red.

Plug your network NetHASP key into the parallel or USB port of the computer where the GTXRaster CAD series software is installed.

Note: ***For Novell NetWare or IPX networks: when authorizing your software, plug the key into a client, not the server. Later, plug it into either the server or a client.***

Authorize Your HASP Key

NOTE You must authorize your software to obtain its full use!

An unauthorized MemoHASP allows 100 uses and an unauthorized NetHASP will limit your software to 100 uses **per user** up to 250 maximum uses.

Authorization Overview
1. Run CUSTOMER.EXE to get your HASP ID
2. Fill in the form and submit. Alternatively, you may use the enclosed blue authorization form and fax it to GTX.
3. Browse to www.gtx.com/authorize.asp
4. Within one working day, GTX will RETURN the authorization form with a RUS PASSWORD.
5. Run CUSTOMER.EXE and use MANUAL option to enter the RUS PASSWORD.
6. Your key is authorized!

DO YOU HAVE AN OLD GTX KEY?

1. If instructed on your new key's envelope, return any old GTX key as soon as possible because GTX cannot authorize your current key until your old key is received.

2. Unauthorized keys allow 100 uses to help you through this period.

3. The number found on your HASP key, the CD-ROM, and the box is NOT your HASP ID. You must get the HASP ID by running CUSTOMER.EXE and selecting GET ID.

Authorization Instructions

RECORD YOUR HASP ID

1. Find your authorization form.

2. Plug the HASP key into the parallel or USB port.

3. Run *CUSTOMER.EXE* from a DOS prompt or double click the file from the Windows Explorer.

4. Select **Get ID [ALT-G]** to retrieve the **HASP ID** number.

5. Write your HASP ID number on the Authorization Form.

6. Exit the HASP ID NUMBER section of the CUSTOMER program by selecting **OK [ALT-O]**.

7. Exit CUSTOMER **[ALT-X]**.

SEND YOUR AUTHORIZATION TO GTX

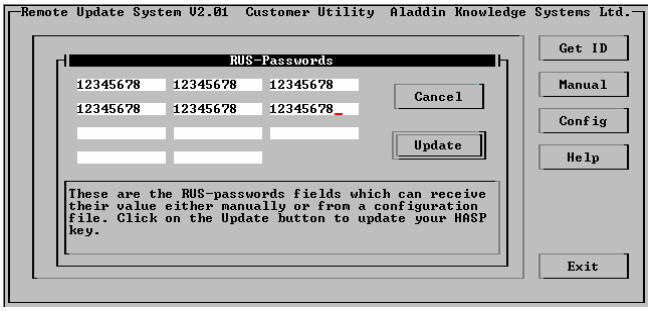
1. Complete the Authorization form, making sure to add the **HASP ID** number and your **FAX number**. The serial number should already be printed on your Authorization Form but if it is not, it is printed on the key and on the box.

2. FAX the Authorization Form to GTX:

ENTER THE RUS PASSWORD

Within one business day, GTX will provide you with a **RUS password** (RUS=Remote Update System). Once you have your RUS password, run ***CUSTOMER.EXE*** again.

1. Select Manual [ALT-M]. Enter the RUS Password, using [TAB] between the separate pieces.


Remote Update System V2.01 Customer Utility Aladdin Knowledge Systems Ltd.
RUS-Passwords
12345678 12345678 12345678
12345678 12345678 12345678
Cancel
Update
These are the RUS-passwords fields which can receive their value either manually or from a configuration file. Click on the Update button to update your HASP key.
Get ID
Manual
Config
Help
Exit

2. If the **RUS password** is entered correctly, a message should appear: *Hasp Updated Ok*

3. If GTX provides more than one Authorization Form, containing RUS passwords, the Customer program must be exited and restarted once for each Authorization Form. If you receive three sets of RUS passwords, you must run the Customer program three times.

The HASP key now allows unlimited uses of the GTXRaster CAD Series software.

Note ***If you are using a single user license, you should be finished installing the HASP key. If you have purchased a network license, continue with the following instructions. Otherwise, skip to* Troubleshooting the Installation*.***

Network License Management

Please refer to *Start.chm*, installed on your system by *SETUP*. This document describes installing the NetHASP system under various operating system and network protocols.

The three steps for establishing network license management are:

1. Install HASP device drivers by running *HDD32.EXE* on each workstation. You should have already performed this step, as described on page 21.

2. Configure each installed copy of the GTXRaster CAD Series for the appropriate operating system and network protocol by running the NetHASP Wizard or by editing the *NETHASP.INI* configuration file, as described in *Start.chm*.

Note ***The NetHASP Wizard creates its own version of* NETHASP.INI *and cannot read the existing version of this file. Rename your* NETHASP.INI *before running the wizard so you do not lose the original file.***

3. Establish the correct license server for your operating system and network protocol. License servers include *NHSRVW32.EXE*.

Establishing Network License Servers

The **License Manager** software can be run from a server or client. Refer to Start.chm for specific information. The **NetHASP server** can run as a Service, without a user logged into the NetHASP Server machine.

1. Run *LMSETUP.EXE* from the *License* subdirectory of the GTX installation directory.

2. The **Status** dialog appears. Select **Next**.

3. The **Destination Directory** dialog appears. Select the directory and then select **Next**.

4. Select Install as Service.

5. Select Install Device Driver.

You may alternatively install the NetHASP Server as a Windows application. This program must be running in order for the license manager to be available.

Check Profile Paths

The GTX and BMPS, directories was added to the support file search path in the GTX AutoCAD profile (created during *SETUP*). If this path is not there, make sure you have the right profile (under AutoCAD's Config command).

Critical Configuration File Parameters

Five configuration parameters are located in the configuration file, *GTXRAST.CFG*:

ProductLevel

ZERO_PLINE

HASPTIMEOUT

HASP_TYPE

DEMOMODE

PRODUCT LEVEL

ProductLevel specifies the software level you intend to run. The installation sets this variable. If this variable is not listed, the program will default to RCADPLUS.

For GTXRaster CAD set ProductLevel = RCAD

For GTXRaster CAD PLUS set ProductLevel = RCADPLUS

For GTXRaster R2V set R2V

For GTXRaster TOOLS set RTOOLS

Note: ***If the product level listed is different from the product you purchased, your program will only run in demo mode. If you keep running in demo mode although you bought the product, make sure your product level is set to the correct level in the configuration file!***

HASP TIMEOUT

Determines the number of minutes of idle time the GTXRaster CAD Series license server will allow before de-activating an inactive license and making it available again.

DEMO MODE

Controls whether GTXRaster CAD series runs in demo mode or attempts to find the HASP key and run as the product level specified by the **ProductLevel** configuration parameter. Demo mode allows nearly all functionality but limits the effective raster area to a 1,000 x 1,000 pixel area.

Valid entries: Yes, No

Adding the GTXRaster CAD Series to an Existing Profile

SETUP generated an icon which runs AutoCAD with a profile in which GTX support paths and menus have been established. If you didn't specify a profile during SETUP that would be the basis for the new GTX profile, a profile was created. If, after installing the GTXRaster CAD Series, you want to run it from a different existing profile:

1. Run AutoCAD under the profile to which you wish to add GTX.

2. Select Tools>Options.

3. Add the *Raster CAD V9.1* and *Raster CAD V9.1\BMPS* directories to the Support File Search Path.

4. For the GTX and AutoCAD short cuts to work, you must “move up” the GTX support path directories to the top position.

5. Select **OK**.

6. The next time you run AutoCAD under the modified profile, GTXRaster CAD Series software should also run. Invoke **Menuload** and load the desired menus (GTXRtoolsV91.cui, GTXRcadV91.cui, GTXR2VV91.cui & GTXRcadPlus91.cui) to your existing menus.

You will not normally need to do this because the installation creates a profile with the required menus and support file paths.

Uninstalling the Software

To remove the GTXRaster CAD Series software from your system, use **Add and Remove Programs** from the Control Panel.

Alternatively, you may run setup program from the CD ROM and select Uninstall.

Removing the GTX Application Files

Note: ***Uninstall will not remove files that were not placed on your system by SETUP, including modified configuration files, AutoCAD drawings or raster images. You need to remove those files yourself.***

Now that AutoCAD is no longer looking for the GTXRaster CAD Series files, you can remove these files from your system.

Using the GTXRaster CAD Series

The Purpose of This Section

This section describes the use of the GTXRaster CAD Series software. The GTXRaster CAD series is a program that operates within AutoCAD 2006 and many of its commands operate in a similar manner to AutoCAD commands. For example, in AutoCAD, the command for moving a CAD entity is **MOVE**. In the GTXRaster CAD Series, the command for moving raster data is **gMOVE**. Both commands use similar prompts to accomplish similar tasks.

Because GTXRaster CAD functions parallel AutoCAD's, you will learn it more easily if you are familiar with the main AutoCAD functions, especially loading and saving drawings, attaching images, drawing and editing.

Raster and Vector

The GTXRaster CAD Series lets you draw and edit, load and save **raster** information. Raster images are made up of dots (**pixels**) which represent pictures by forming an electronic mosaic. If you zoom close to a raster image, you will see each pixel as a square.

AutoCAD lets you draw and edit, load and save **vector** information. CAD drawings are made up of vector **entities** in which coordinates and other measurements are expressed mathematically in the CAD drawing. For example, a line is defined mathematically as the X and Y coordinates of each of its endpoints. A circle is defined as the X and Y coordinates of its center point and the length of its radius. Load a sample drawing into AutoCAD, window some of the entities and type **LIST**. You will see a barrage of entity types and coordinates.

Note: ***It is easy to attach the same image twice in the same drawing. Each image object refers to the same raster file, so if the image is somehow changed on the disk, the images will immediately change in the drawing!***

AutoCAD 2006 and Raster Images

AutoCAD lets you **Attach** raster images within vector drawings, displaying the raster within **image entities**. Image entities do not store the image data; they only refer, or link, to raster files already residing on disk. Attached raster files must be present for them to appear within AutoCAD. You can set properties for an image entity in a drawing, but these properties are only stored in the AutoCAD drawing, only affect the appearance of the image and do not directly affect the raster file at all.

AutoCAD will let you copy, move, rotate, resize and clip a raster image object within an AutoCAD drawing. The Image Adjust feature adjusts the display of an image's brightness, contrast, fade and transparency.

An AutoCAD drawing provides an excellent framework for managing and modifying one or more related raster images. AutoCAD lets you display images to scale with the AutoCAD vector drawing coordinates.

What Does GTX Add to AutoCAD?

The GTXRaster CAD Series adds raster enhancement, editing and conversion abilities to AutoCAD's display and plotting capabilities. GTXRaster CAD can modify attached raster images and save them. GTX lets AutoCAD attach new raster formats. GTXRaster CAD extends AutoCAD's AutoSnap feature to work on raster data, making it easier to trace over raster information with AutoCAD entities. The GTXRaster CAD Series lets you easily convert whole selections of raster into intelligent CAD entities within the AutoCAD drawing. GTX OSR provides batch conversion. GTXRaster R2V and GTXRaster CAD *PLUS* provide conversion clean-up tools to help make converted data more precise.

Product Functionality

Loading Raster Images Into AutoCAD

AutoCAD and GTXRaster CAD provide you with several ways of importing raster images. To load a raster image into AutoCAD, the software **attaches** it within AutoCAD drawing. The image is not stored in the .DWG file, but is viewed through it. When attaching an image, be sure of whether you are putting it in paper space or model space. Although the raster is only an image of a paper drawing, you can attach an image in model space and then scale the **image entity** so it is to scale with the AutoCAD coordinate system.

Learn to use AutoCAD's **IMAGE>Attach** command before using any other methods. AutoCAD also supports dragging and dropping raster files of TIFF or .CAL raster formats.

GTXRaster CAD provides the **gATTACH** command to quickly attach images without prompting for insertion point, scale and orientation. Instead, it makes certain assumptions about how to place, scale and orient raster images.

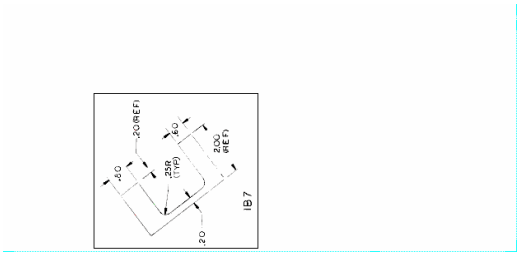
Attach Method (Source)		
IMAGE>Attach (AutoCAD)	▪ Command supported by AutoCAD ▪ Offers full control of insertion point, scale & orientation	▪ Numerous steps to import an image
Drag-and-Drop (AutoCAD)	▪ Easy to specify file - just drag it	▪ Still have to specify insertion, scale & angle ▪ Only works with TIFF, & CALS formats
gATTACH (GTX)	▪ One-step image import ▪ Migrates earlier GTX hybrid images to 2006 ▪ Equivalent of gLOAD of earlier GTX versions.	▪ Always inserts images that have no associated .REF file at same location, scale and orientation.

Scaling and Aligning Attached Raster Images

Once an image has been imported into AutoCAD, it should be scaled and aligned to fit the drawing. Learn how to use AutoCAD's **SCALE** command to properly scale the drawing. If you are working with line diagrams without a scale factor, you will probably want to bring attach images at a scale of 1, duplicating the original paper drawing. Use the scale factor of scanned drawings to determine how to scale its image entity to match the AutoCAD model space coordinates.

Example:

Having attached *SIDE.CG4* from the GTX tutorial files at 0,0 at 0 orientation at scale of 1, the drawing would look like this:



Command	Explanation
Command: SCALE	Invoke the SCALE command
Select objects: 1 found	Select the SIDE.CG4 image entity
Base point: 0,0	Scale from the base point 0,0
<Scale factor>/Reference: R	Use a reference length to scale the image entity
Reference length <1>:	Pick the first point along the 2 dimension
Second point:	Pick the second point along the 2 dimension
New length: 2	Type what the dimension reports its length to be

The dimensions in the raster image indicate the required size of the raster if it were a drawing represented within AutoCAD's model space.

The raster image will scale itself so that the geometry it portrays is to scale with AutoCAD's model space.

Note: Raster line widths will also scale along with raster images.

Orienting and Rotating Image Entities

Often paper drawings are scanned sideways. If you used AutoCAD's **Image>Attach** command to import a raster image, it may end up sideways. There are two ways to solve this problem:

ROTATE COMMAND

GROTATE COMMAND

The **gROTATE** command rotates raster data within the raster image. It is useful for raster editing, but is not recommended as a tool for registering images within AutoCAD drawings.

AutoCAD's **ROTATE** command can rotate the image entity, effectively correcting its appearance in the drawing. Some problems with this are:

- The insertion point is no longer the lower left point because it gets rotated along with the image entity.
- The image entity rotates about some base point, which can require additional adjustments to correctly line up the image.

gTURN Command

The **gTURN** command can also be used to rotate an image, but it preserves the insertion point as the lower left point. Advantages of using this command are:

- The raster is turned inside the image entity, maintaining the lower left point as the insertion point.
- Because the raster turns rather than the image entity, the entity hasn't moved about any base point. If the image was in the right position before invoking **gTURN** then it requires no further moving or adjusting.

Either technique positions raster data; **gTURN** does so in fewer steps.

Creating New Raster Images

The GTX command, **gCREATE**, allows you to create a new raster image. Just like scanned images that were captured from paper or mylar drawings, new images should be drawn at some drawing scale. New raster images are limited to realistic sizes. Create new raster images that are approximately paper-sized, and then scale the image entities using AutoCAD's **Scale** command.

For example, when creating a new image, you cannot make a raster image equivalent to a piece of paper the size of a city block. Instead, create a raster image the size of a large sheet of paper (E- or A0-size). Then scale the image entity with the **Scale** command. This way you can avoid attempting to create oversized raster images.

Cropping Raster Data

Two commands are useful for erasing raster outside a rectangular area.

gCROP erases raster data outside a rectangular box. The raster image stays the same size.

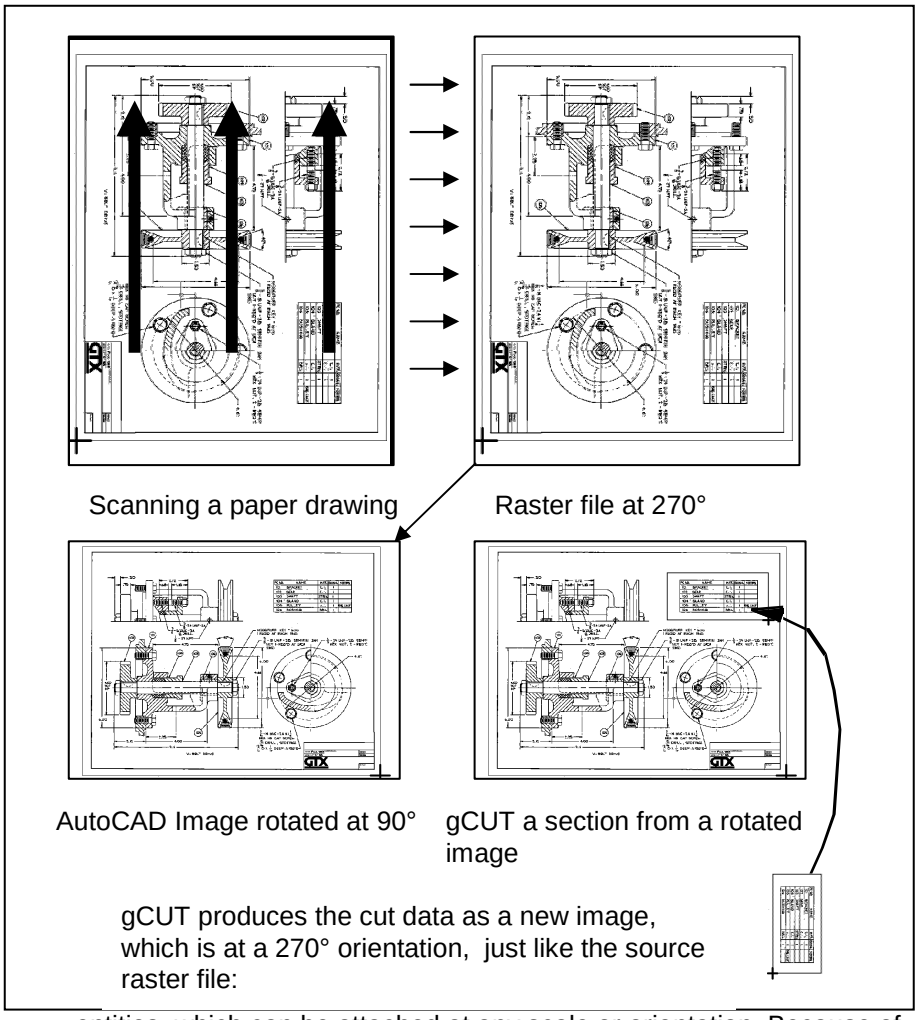
gRESIZE removes the portion of the raster image outside a selected box. Raster data outside this box is erased because the raster image no longer occupies that space.

Modifying Images

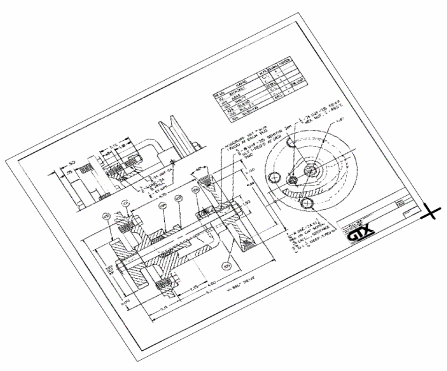
gACTIVE loads the image into the GTX editor, making it the current image for editing. If there is no active image, raster editing commands will invoke **gACTIVE** before proceeding. When there are multiple images attached, **gACTIVE** command will require you to select the image to prepare. If there is only one image attached in AutoCAD, **gACTIVE** will automatically prepare it. **gINACTIVE** releases the image, recovering memory.

Cutting and Pasting Raster

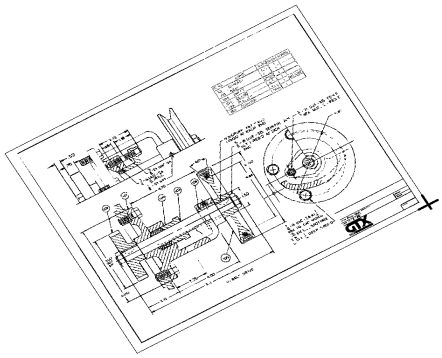
The GTXRaster CAD Series displays raster through AutoCAD image


Scanning a paper drawing
Raster file at 270°
AutoCAD Image rotated at 90°
gCUT a section from a rotated image
gCUT produces the cut data as a new image, which is at a 270° orientation, just like the source raster file:

entities, which can be attached at any scale or orientation. Because of this, the **gCUT** and **gPASTE** commands may behave differently than before.

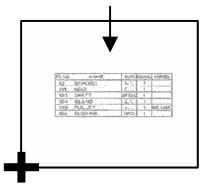


AutoCAD image rotated at 30 °



gCUT from a rotated image

gCUT produces the cut data as a new image, which is at a 0° orientation, not at 30° like the source image entity. The border is larger than that specified during the gCUT command because it was cut at an angle.



Images oriented at angles other than 0 and 90 behave consistently. In this example, an image was inserted at a 30° orientation, and gCUT is used to create a new image. The cut image is taken from the source image at 0° - not at 30°:

Converting Between Raster and Vector

The GTXRaster CAD series provides many commands that will convert data between CAD and raster formats. These commands are found under the GTXConvert menu.

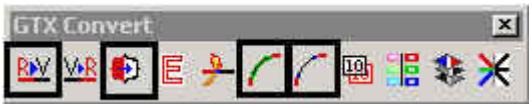
For more information, see the references for the following commands:

VECTOR-TO-RASTER COMMANDS

gRASTER, **gBURN**

RASTER-TO-VECTOR COMMANDS

gCONVRT, **gECONVRT**, **gTRACE**, **gVECTOR**



INTELLIGENT CHARACTER RECOGNITION

gTCONFIG, **gTRAIN, gTCONVRT**

Vector Cleanup

The commands under the GTXVClean menu aid in cleaning up drawings after conversion from raster. For more information on each command refer to the light blue backed icons in the 'Command Reference' section.

Snapping to Raster

GTXRaster CAD provides many transparent raster snap methods that help you select points precisely within raster images. But these raster snaps can be used when drawing raster *or* vector entities as well!

RASTER AUTOSNAP

Better yet, GTXRaster CAD, GTXRaster R2V and GTXRaster CAD PLUS raster-enable AutoCAD's AutoSnap™ feature in which a ToolTip appears to indicate the type of raster snap being employed.

The GTX command, **gAUTOSNAP**, controls whether AutoSnap™ will work within an image. Refer to the gAUTOSNAP command reference for more information.

Saving Images

The GTXRaster CAD Series provides several ways of saving modified images. In addition to saving .DWG files, AutoCAD's **SAVE** command will also save any changed images.

The **gSAVE** command lets you change the filename (and image name) of an image.

Command	Description
SAVE	Saves .DWG and any modified images.
GSAVE	Saves the current image. Optionally saves a .REF file along with the image.
QUIT	When quitting AutoCAD, unsaved images can be saved. After saving, AutoCAD .DWG is saved.

GTXRaster CAD Series Performance Factors

Because raster images can be so large, certain operating parameters affect system performance. In Minimum Requirements, we described the minimum recommended hardware configuration. The following AutoCAD and GTXRaster CAD Series parameters can also optimize display and editing speed:

Automatic Save Interval

GTXRaster CAD Series saves modified raster images every time AutoCAD performs an **Automatic Save**. You can increase the time interval between automatic saves and minimize this kind interruption by increasing the AutoCAD *SAVETIME* system variable.

Swap Space

Larger paging files can help performance when working with large raster images.

Aerial View

The aerial view maintains a second copy of the image in memory. To save memory you can keep this view closed. Additional processing time is taken when the Aerial View is set to automatically update. Turn off the automatic update option after loading the drawing.

Current View/Zoom

Redrawing images takes extra time. Performing a command generally takes longer if you are zoomed to extents than if you are zoomed in on a small area of the drawing.

Image Quality

Set the **Image Quality** to Draft to save additional time. High quality slows processes. Raster plotting occurs at high quality even when images are displayed in draft mode.

Multiple Images

AutoCAD easily handles multiple overlaid or tiled images. Attaching additional images can slow editing response.

Working with Color Images

The GTXRaster CAD series has been designed to work predominantly with binary (Black & White) images and cannot directly edit color images like photos or high color pictures. However the new color commands allow extraction and conversion of color images to bitonal images that can then be edited and converted to AutoCAD entities.

Many color images use a limited range of colors. A good example of this is a road map where the data is displayed in a limited number of base colors.

In this example the roads are shown as black, the land contours are brown & the sea is blue. In these instances GTX provides commands to enable you to reduce the colors down to a more manageable range of colors. The GTX color related commands to do this are:

gBITONAL

gREDUCE

gSEPARATE

The best command to use depends mainly upon the number of colors that your image has.

Quick reduction to Binary.

If you wish to automatically reduce a color image down to a simple binary image you can use gBITONAL. The gBITONAL command has been optimized to operate on a broad range of color images & works well where an image has a clear-cut distinction between dark & light data.

However, the gBITONAL threshold may not give the exact results that you desire (by including or omitting important data from the binary image). In these instances it may be better to use the gREDUCE & gSEPARATE commands, where you have greater control of the color separation & threshold.

More than 256 colors.

If you have an image with greater than 256 colors you can firstly use gREDUCE to bring the image down to 256 colors or less.

Less than 256 colors.

For images with colors less that 256 colors, either before or after using reduction, you can use the gSEPARATE command. This allows you to accurately select colors, or groups of colors, & break then out into separate binary color images.

These separate binary images can, if required, be further processed using the full range of GTX capabilities & commands detailed elsewhere in this help file.

For more detailed information about each command's operation refer to the respective section in the 'Command Reference'.

Supported Color file formats.

When working with color images in GTX you can only save in

.tif (uncompressed TIFF),

.**bmp** (Uncompressed Bitmap),

.png (Portable Network Graphics),

.tga (Taga),.flc & fli (Autodesk FLIC) &

.pcx (PC Paintbrush) formats.

Also, if you originally loaded a **.jpg** (JFIF JPEG) file you will additionally be offered the option of saving in .jpg (JPEG) format.

JPEG Format files.

Although GTX can load & save .jpg (JPEG) files it is not an ideal operating format for GTX work. This is because JPEG is a format intended to work with pictures & photographs & when saving in JPEG format colors can automatically be added & removed from the color pallet. As such you can actively lose data by working & saving in JPEG format.

If possible we recommend that you save JPEG files in .TIF or .PNG format to avoid losing image definition.

Anti-Aliasing

Some color images are scanned with the 'anti-aliasing' option turned on. Anti-aliasng can enhance the quality of some images, particularly photographs. However it is not ideal for images with solid fill color as It tends to mix colors to achieve a more blurred image.

Whilst the gSEPARATE command will work with anti-aliased images the results may not be as good as required. As such we recommend that, if possible, images be scanned with anti-aliasing turned off.

Getting Started

Using the Tutorials

To get the most from these lessons you should be familiar with AutoCAD 2006's image commands. Experiment with the AutoCAD **Image** command to attach images within AutoCAD, **ImageAdjust**, **ImageQuality**, **Transparency**, basic drawing and property-modifying commands (entity drawing commands, the **Properties** command, **Object Snapping** modes).

Following the Lessons

Try performing these exercises twice. The first time, follow the instructions literally to learn how each command and feature works. The second time, try to accomplish the same results as fast as possible, using the options and techniques with which you are most comfortable.

You won't need to change your approach to working with AutoCAD to use the GTXRaster CAD Series. The toolbar icon and keyboard shortcut for each command and feature have been provided in the left margin.

Standardizing Your Environment for the Tutorials

The lessons invoke GTXRaster CAD Series features from menus.

The AutoCAD variables CMDDIA and FILEDIA control whether dialog boxes are used in certain commands. If CMDDIA and FILEDIA are set to 1, many GTXRaster CAD Series commands use dialog boxes. If these variables are set to 0, many GTX commands will use AutoCAD command-line prompts. The lessons will describe the commands as they run with these variables set to "1".

Editing a Raster File

A typical editing session begins with enhancements that operate on most or all of the drawing. Next, make more detailed changes. Finally, focus on the overall picture to make sure the sections are properly matched and aligned.

1. The GTXRaster CAD Series cannot modify images until you prepare them for editing. (**gACTIVE**)

2. Get rid of meaningless or unwanted raster to reduce memory requirements and to clean the image. (**gCROP**, **gSPECKL**, **gERASE**)

3. Because documents are usually scanned at a slight angle, deskew raster drawings before proceeding. (**gDESKEW**)

4. Next, perform editing functions that involve the whole drawing or large areas of the drawing. (**gMIRROR**, **gCUT**, **gPASTE**)

5. Completely edit the image in one area before moving on to another area. Insert missing objects and correct distortions with both AutoCAD and GTX commands. Leave new entities in vector format or rasterize them using **gRASTER**. Use **Raster Snapping** methods to select points on raster geometry just as you do using object snaps.

6. Create and edit text. If using GTXRaster CAD *PLUS*, use **gTCONVERT** to convert raster text into AutoCAD text entities.

7. Look at the whole drawing and make any required changes (**gCOPY**, **gMOVE**, **gROTATE** and **gSMOOTH**).

8. Place new border and title block if needed.

9. Save the file. (**SAVE**, **gSAVE**, **gCUT**).

Lesson 1: Raster Cleanup

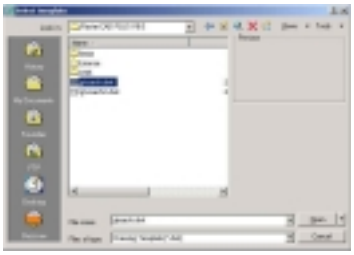
In this lesson you will load a raster file and clean it using GTXRaster CAD enhancement commands. You will then edit it using a combination of GTXRaster CAD and AutoCAD commands. You will then save the edited file.

Load a Raster File

The GTXRaster CAD Series software displays a vector CAD drawing in front of scanned raster images. You can edit the vector file in the foreground using the raster backdrop as a guide. You can use AutoCAD's **IMAGE>ATTACH** command or GTX' **gATTACH** command to load raster files directly into AutoCAD.

1. Run AutoCAD.

2. Select **File>New** to set up a new AutoCAD drawing:



3. Select the tutorial template file *C:\Program Files\GTX\Raster CADV9.1\sample\GTXARCH.DWT.* This template contains limits and views set up to standardize this exercise.

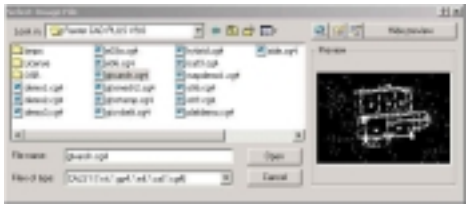
4. Select **OK**.

5. Note that in the upper left corner of the screen the filename is listed as Drawing.dwg. To change this, select **File>Save**.

6. Select **OK**.

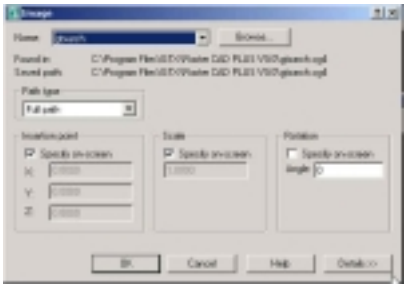
Attach an Image Within AutoCAD

1. Select Insert>Raster Image....



2. Select the tutorial drawing, c:\program files\gtx\raster cad V9.1\sample\gtxarch.cg4 and click **Open**.

3. Make sure that the **Insertion Point**, **Scale** and **Rotation** "specify on screen" checkboxes are empty.



4. Type "0,0" for **Insertion Point**, type "1" for **Scale** and type "0" for **Rotation**.

5. Select **OK**.

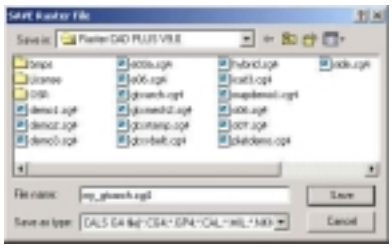
6. The image is attached. Zoom ALL to view the entire drawing

7. Select **File>Save** to save the drawing, now with the image attached. Call this drawing <*Your Name*>*.DWG*.

8. Zoom to the drawing's limits (**Zoom**, **All**).

In the second tutorial you will learn a faster way to attach a raster image in AutoCAD.

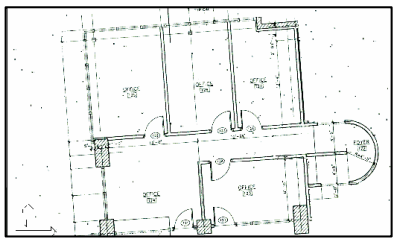
Rename an Attached Image



Select **GTXImaging>Save**. Save the raster image with your name as the filename (*c:\program files\gtx\raster cad V9.1\sample*<*Your Name*>*.cg4*).

The file has been saved under the new filename.

Enhance the Raster Image



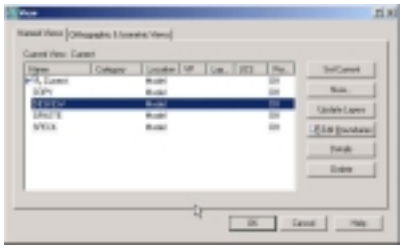
Now you will use GTXRaster CAD Series commands to clean up the raster drawing.

Use gDESKEW **to Straighten the Drawing**

This drawing is slightly rotated (**skewed**). You will use the **gDESKEW** command to straighten it. This command requires two points to define a reference line that should become either vertical or horizontal. You will use the vertical dimension line along the left of the image.

1. To see this area more clearly, you will use the tutorial view named "deskew". Select View>Named Views...

2. Select the view named **DESKEW**, then **Set Current** and **OK**. The view will zoom closer to the image.



3. To edit this raster image, it must be prepared using the **gACTIVE** command. Select **GTXImaging>Active Image**. **gACTIVE** automatically sets *gtxarch.cg4*, the only attached image, as the **active image**.

4. Select GTXEnhance>Deskew.

```
Select raster <WINDOW>:
```

5. Type **All** to select the entire drawing for deskewing. The entire drawing will be highlighted.

6. Press **[RETURN]** to stop selecting raster.

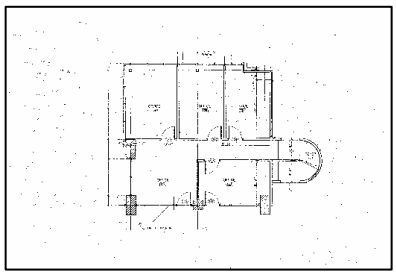
```
Select one end of reference line:
```

The reference line follows a line that would become exactly horizontal or vertical after the image is deskewed. For the first point, you will use a raster-snap mode to select the lower left corner of the drawing.

7. Select GTXEdit>Raster Snaps>Intersection.

8. Select a point on the intersection of the dimension lines at the lower left. The reference line is anchored to the selected raster intersection.

```
Select other end of reference line:
```



9. Again, use the Intersection raster snapping option to select the point at the upper left corner. Intersection IOP can also be obtained by typing **'rint**, from the gtx pop-up menu (by holding **[Control]** while clicking the right mouse button) or through stacked IOP icon on the edit toolbar.

```
Deskewing 4.016183 degrees.
```

After a moment, the image will be straightened.

10. Zoom **Extents** to see the results.

Use gCROP **to Clean Up Borders**

Often drawings are darkened, torn or speckled at the edges. The **GTXEnhance>Crop** command is a quick way to delete the unwanted raster around the outside of the drawing by letting you window the raster you want to keep. All raster outside the window is erased. **gCROP** decreases the size of the file, freeing memory.

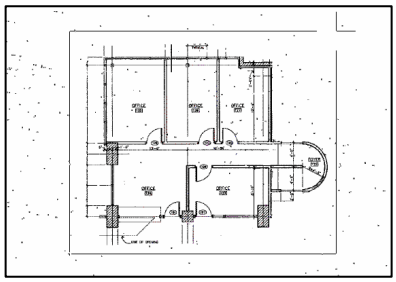
1. Select GTXEnhance>Crop.

```
Select first corner of window:
```

2. Select a point near the lower left corner of the drawing, just below and to the left of any significant objects.

```
Select opposite corner of window:
```

3. Stretch the window up and to the right until it encloses all the meaningful raster geometry, leaving only speckles outside.



All speckles outside the window are deleted.

4. If you made a mistake, select **Undo** and repeat the above steps.

Use gSPECKL **to Remove Speckles**

Scanned drawings often contain unwanted smudges, gaps, stray lines and speckles. The **gCROP** command removed the speckles at the drawing's edge, but there are still many speckles in the middle. The **gSPECKL** command can be used to filter speckles from the image without removing meaningful geometry such as decimal points. It can also be used to fill in small gaps in solid raster.

First, indicate the maximum size for the speckles (or holes) to be affected, then indicate whether you want to delete speckles or fill in holes.

Then, window the areas where the speckles or holes are. If punctuation marks or other significant objects are highlighted, **Remove** them from the pick list. The advantage of **gSPECKL** over **gERASE** is that you can make windows quite large since only objects fitting the speckle size will be affected. If unwanted speckles remain after the first pass, you can change to a larger speckle size for another pass just in the areas of the speckles.

1. It will be easier to see the speckles you are going to filter out of the image if you zoom into an area. Use the **View** command to set as current the view named “SPECK” to enlarge the rooms at upper left.

2. Select GTXEnhance>Speckle.

```
Command: gSPECKL
Speckle size<0.00>/Box/Pick:
```

3. Type: P for Pick

```
Select raster speckle:
```

4. Select a small speckle.

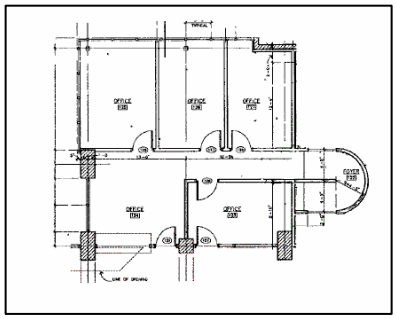
```
Mode<Delete speckle>/Fill hole:
```

5. This time you are removing speckles, not filling in holes. Press **[RETURN]** to accept “Delete Speckle”.

```
Select raster<WINDOW>:
```

6. Type: **V**

   The **View** option selects the current display. All of the speckles smaller than the selected speckle size will be highlighted on the screen. Pressing **[RETURN]** would delete all highlighted raster, but some of this is data. Despeckling can delete raster text characters such as “.”.



7. To avoid erasing text, type **R** for **Remove** and window around the meaningful raster to remove from the selection set. The **Remove** icon looks like a minus sign “-”, while the **Add** icon looks like a plus sign “+”.

```
Remove raster<WINDOW>:
```

Note that the prompt now reads, “Remove raster” instead of “Select raster”. Window areas of text until only speckles are highlighted. Press **[RETURN]** to end raster selection. The highlighted speckles will disappear from the screen. If you spent a long time removing useful information from the selection, then you chose too large a speckle when setting the speckle size. Next time you can select a smaller speckle or use the **Box** feature while selecting speckle size to specify a smaller speckle filter.

8. **PAN** one screen to the right by clicking to the right of the slider at the bottom of the screen. Start **gSPECKL** again. If the speckle size was adequate, you can use the same speckle size by pressing **[RETURN]** at the “Speckle size” prompt. Continue this step by despeckling the rest of the drawing.

Save Your Changes

After spending time editing the drawing you will want to save the changes. You will want to save the image to a different name to preserve the original tutorial image.

Select **File>Save**. This will save not only the AutoCAD drawing but also the attached raster image.

Edit Raster Geometry

You are ready to use the GTXRaster CAD Series raster editing commands to change the drawing.

Use gCOPY to Copy Raster Geometry

1. Zoom in on the upper-left room, including some of the empty space to its left.

2. Select GTXEdit>Copy.

```
Select raster<WINDOW>:
```

3. Use the **Window** option to select the room.

4. You will not want to copy everything, however, so type **R** for **Remove**. Note that the prompt changes to Remove Raster:

```
Remove raster <WINDOW>:
```

5. Type **L** for **Line**.

```
Select one end of reference line:
```

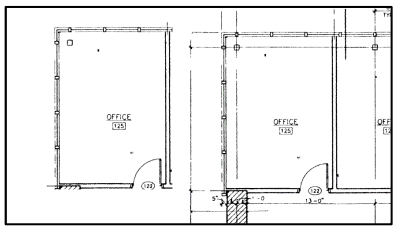
You will remove the horizontal dimension line just below the top wall of the room.

6. Select a point beyond the left end of the line.

```
Select other end of reference line:
```

7. Select a point beyond the right end of the line. The line will be removed from the selection set.

```
Remove raster <LINE>:
```



8. Likewise, remove the vertical line just inside the left wall.

9. Press **[RETURN]** to finish selecting raster geometry.

```
Base point or displacement:
```

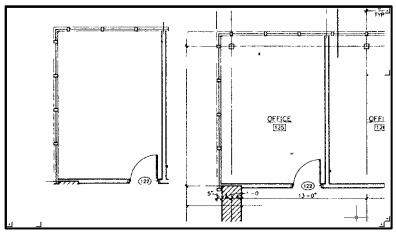
10. Select a point near the lower right corner of the room.

```
Second point of displacement:
```

11. Select the point for the copy placement. It should be to the left of the drawing, so the results appear as shown in the figure below. The copy of the room will appear.

Use gERASE **to Remove Raster Geometry**

You will use **gERASE** to remove the text, the vertical line and the little box where the lines intersected.

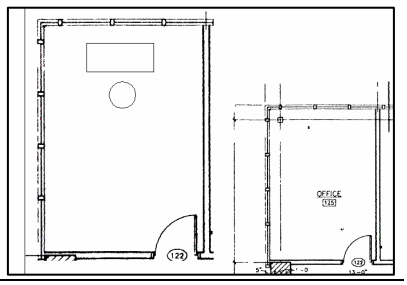


1. Select GTXEdit>Erase.

```
Select raster<LINE>:
```

2. Type **I** for the **Inside** picking method.

3. Window around the text: “OFFICE”, the little box containing “125”, and the small square in the upper left corner.



4. Press **[RETURN]**. All clear!

Use gSCALE to Resize Raster Geometry

1. Select GTXEdit>Scale.

```
Select raster<INSIDE>:
```

2. Select the copy of the room and press **[RETURN]**. You will need to draw a rectangle that completely encloses the copy of the room with no part of it extending outside of your window because the **Inside** selection method is still being used. To do this you may have to pan or zoom.

```
Base point:
```

3. Select the lower right corner of the room.

```
Scale factors<1.0,1.0>/Fit:
```

4. Type: 1.5,1.5

   The room will be enlarged. You may need to Zoom out to see it.

5. In the scaled copy of the room, draw a vector rectangle and a circle to represent a desk and chair. Keep some space in between the table and the top wall as shown in the illustration below:

Use gRASTER to Rasterize Vector Geometry

Now you can incorporate these vector entities into the raster drawing with the **gRASTER** command.

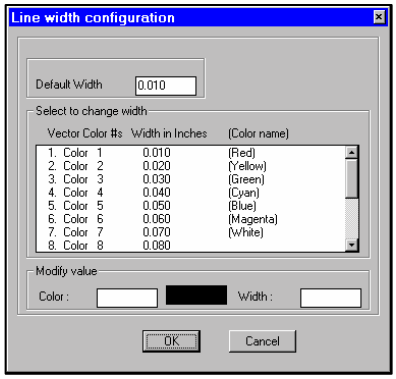
1. Now select GTXConvert>Rasterize.

```
Select objects:
```

2. Select the rectangle and circle representing the chair and desk.

3. Press [RETURN]. The **Rasterize Setup** dialog will appear.

4. Select the **Table** radio button and the **Table Setup** button. The **Line**



Width Configuration table will appear, showing line widths of raster entities to be generated from each color of vector entity.

5. Note the color of the vector entities drawn and the color's corresponding raster width and select **OK**. Select **OK again** in the **Rasterize Setup** dialog to accept the parameters.

```
Rasterize in progress .. 2 segments
Percent complete = 100.0
```

The entities will be converted to raster with a width corresponding to .04 inches, assuming the entities were Color 7 = "White" (or black if your background color is white).

6. Suppose the raster was too thick. Select **Undo** to return the raster and vector to the way it was before rasterizing.

7 Select **gRASTER** and again select the entities.

8. Type: **.02** in the **Fixed Width** text field.

   Entering **.02** specifies the absolute width for all entities, regardless of color. This absolute value will be the default width for subsequent commands.

Use gCUT **to Save Selected Raster Geometry**

You could add furniture to the other rooms in the layout if you scale it down. You can copy, scale and even rotate all with the **gPASTE** command. First you have to **gCUT** the raster before it can be pasted. Raster is selected and written to a separate raster file or buffer and can be pasted elsewhere. The **gCUT** and **gPASTE** combination works similar to the AutoCAD **BLOCK** and **INSERT** or **CUTCLIP** and **PASTECLIP** commands. It allows you to create standard images that can be placed repeatedly in one drawing or in different drawings even if the scale is not the same.

1. Select **GTXEdit>Cut**.

```
Mode <Copy>/Erase:
```

2. Press **[RETURN]** to select **Copy**.

```
Select raster<INSIDE>:
```

3. Window around the desk and chair. They will be highlighted. Press **[RETURN]**.

```
Select lower left corner of raster limits:
```

4. The lower left corner becomes the “insertion point” when pasting the image. Select a point below and to the left of the highlighted objects as if you were picking the first point for a window.

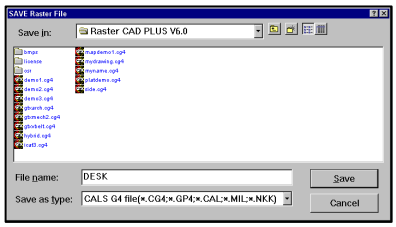
```
Select upper right corner of raster limits:
```

5. Select the second point near and above and to the right of the desk.

```
Destination File/<Buffer>:
```

6. Type **F** to copy the selected raster to a file.

7. Save the file to C:\Program Files\gtx\raster cad V9.1\desk.cg4.



Replacing Raster Text with Vector Text

1. Zoom in on the lower right office.

2. Type AutoCAD text over the raster text.

3. Move the AutoCAD text to the lower left corner of the room.

4. Select GTXEdit>Erase.

```
Select raster<WINDOW>:
```

5. Type **IN** to select **Inside** a rectangular box.

6. Draw a rectangle around the raster text in the lower right room.

7. Press [RETURN].

The text is erased.

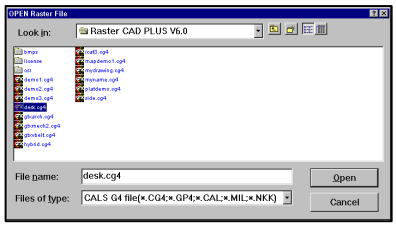
Use gPASTE to Insert Cut Raster Geometry

You will next paste the desk first into the room at the lower left.

1. Zoom in on the room in the lower-left office in the drawing.

2. Select GTXEdit>Paste.

```
Source File/<Buffer>:
```



3. Type **F** to paste data from a raster file.

4. Select C:\Program Files\GTX\Raster CAD V9.1\desk.cg4.

5. Select a point inside the room near lower left corner. It does not have to be in the exact spot as you can adjust the location later.

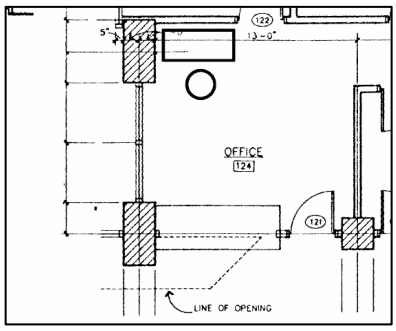
```
Loading raster -- DESK.XXX ...
Move/Rotate/Scale:
```

6. The data will appear with its lower left corner at the insertion point. Obviously the scale is too large. Type **S** to select the **Scale** option, highlightling the pasted raster.

```
Base point:
```

7. Select a point at the lower left corner of the desk-chair arrangement.

```
Scale factors <1.0,1.0>/Fit:
```



8. Type 2/3,2/3

   The data will be made smaller and the highlighting will disappear.

```
Move/Rotate/Scale:
```

9. Select **Move**.

```
Base point or displacement:
```

10. Select the upper left corner of the desk. A line will rubber-band from this point.

```
Second point of displacement:
```

11. Move the box such that the furniture is next to the door in the wall at the top of the room.

```
Move/Rotate/Scale:
```

12. You can keep moving the image around, or press **[RETURN]** to exit the command when you are satisfied.

Use gCOPY **to Copy Raster Geometry**

1. Zoom ALL

2. Select GTXEdit>Copy.

3. Type: **PR** for Previous, highlighting the pasted raster.

4. Press [RETURN].

```
Base point or displacement:
```

5. Select the upper left corner of the “desk”.

```
Second point of displacement:
```

6. Select a suitable location in the middle of the lower right office, creating a copy of the image.

7. You can continue to copy the same image to other locations by re-selecting the command and **PRevious** and then selecting points.

Use gROTATE **to Rotate Raster Geometry**

Perhaps you would prefer to have the desk turned a different way in some rooms.

1. Zoom in on the lower right room.

2. Select **Edit>Rotate** from the menu.

```
Select raster<WINDOW>:
```

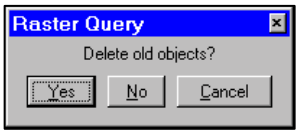
3. Type **O** to use the **Object** picking method. Select the left mouse button on the desk and chair in the lower left office. The desk will be highlighted. Press **[RETURN]** when done.

```
Base point:
```

4. Select a point in the center of the chair.

```
Rotation angle <0.0>/Reference:
```

5. Type: **-90**



6. Select **Yes** to delete the original un-rotated desk.

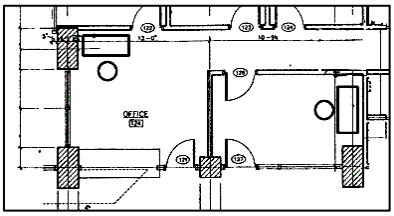
7. Select **gMOVE** and **PRevious** to reposition the image to the desired location.

```
Base point or displacement
```

8. Select the upper left corner of the desk. A line will rubber-band from this point.

```
Second point of displacement:
```

9. Move the furniture to the right.



10. Select **File>Save** to save your changes.

End the Session

You are now finished editing this drawing.

1. **SAVE** the AutoCAD drawing, the changes made to the raster image were also saved.

2. **CLOSE** the drawing.

Loading Your New Drawing

OPEN <*Your Name>.DWG*. The drawing will load just as you saved it.

What You've Learned

Congratulations! You have completed the first lesson on cleaning up a drawing.

You learned to use:

- **gSAVE** to save an attached image to a new filename.
- **gACTIVE** to prepare an image for editing.
- **gDESKEW** to straighten a skewed image.
- **gCROP** and **gSPECKL** to remove unwanted raster.
- **gCOPY** and **gSCALE** to enlarge a portion of the image.
- **gRASTER** to incorporate vector elements into the raster image.
- **gCUT** and **gPASTE** to create images and insert them within other images.
- **Raster Picking** and **Raster Snapping** methods to select raster for editing.
- **gERASE** and **gUNDO** to correct mistakes.
- **gSAVE** and **gCUT** to save raster.

Lesson 2 : Raster Revision

You will load a drawing that has a few errors and needs revision. You will use raster editing tools to make the necessary changes and selectively **vectorize** part of the drawing. You will use two images in one drawing.

Load a Raster File

1. Select **File>New** to start a new drawing. The **Create New Drawing** dialog will appear:

2. Use the template, C:\Program Files\GTX\Raster CAD V9.1\Sample\GTXMECH.DWT. Select **OK**.

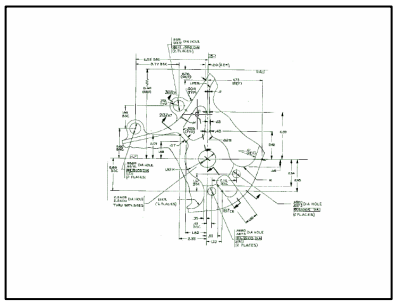
3. Save this drawing to change its name from Drawing.dwg. Invoke the AutoCAD **SAVE** command:

4. Enter your name with a "2" after it (*C:\Program Files\GTX\Raster CAD V9.1\Sample\<Your Name>2.cg4*) under **New Drawing Name**.

5. You will use the **gATTACH** command to quickly attach a raster image. Select **GTXImaging>Quick Attach** (you can also type **GA** for short).

6. Select *C:\Program Files\GTX\Raster CAD V9.1\Sample\gtxmech2.cg4* as the raster file to load. The raster file is immediately attached at 0,0 at a scale of 1 and an orientation of 0 degrees.

7. **Zoom All**. Notice that the raster data is rotated 90 degrees from 0 upgright. If you do a **LIST** on the image entity you'll notice that its *rotation angle* is 0 degrees. To correct this, you will have to rotate the raster 270 (= -90) degrees. Instead of using AutoCAD's **ROTATE** command, you will use **gTURN**.



8. Invoke **gTURN**.

```
Specify rotation angle <90>/180/270:
```

9. Type 270 and press **[RETURN]**. This rotates the raster *data* to 0° without rotating the AutoCAD image object.

Renaming the Raster File

So that you do not save this raster image over the tutorial drawing, you will save it to another name:

1. Select **gSAVE**.

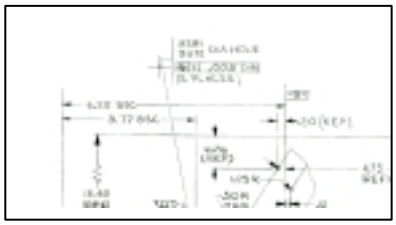
2. Give the raster file a new name - name it your name with a “2” after <Yourname>2.cg4.

3. Invoke **gINFO** by selecting **File>Information**. This command tells you about the (new) current raster image. Press **[RETURN]** to continue.

Scaling the Image

Paper drawings are created “at scale” to fit within the paper’s limits. CAD is typically created at a 1:1 scale because there is no limit to the distance CAD can represent. The attached image entity must be scaled so a distance in the raster becomes equivalent to an AutoCAD distance.

1. Use the AutoCAD **VIEW** command to set as current the view named, “Scale”. The view will have zoomed in on the upper half of the drawing, as shown above. To the left is a dimension indicating a horizontal distance of “6.25”.



2. Invoke the AutoCAD **SCALE** command

```
Select Objects
```

3. Select the image by typing **ALL**.

```
Base point:
```

4. Type **0,0**.

```
<Scale factor>/Reference:
```

5. Type **R** for “Reference”.

```
Reference length <1>:
```

6. Use the **'rend** raster snap to select one end of the horizontal "6.25" dimension line.

```
Second point:
```

7. Select the other end of the dimension line.

```
New length:
```

8. Type: **6.25** to set the specified distance to 6.25 drawing units.

The scale of the image object will be adjusted so that the distance between the dimension lines becomes 6.25 units long. You can use the AutoCAD **DIST** command to verify this.

Enhance the Raster Image

Note: ***To start gDESKEW the program needed to prepare the image for editing with the gACTIVE command. Because there is only one image, it automatically activates it. Most raster enhancing/editing commands will start gACTIVE if there's no active image!***

Now you will use enhancing commands to clean up the raster drawing.

Use gDESKEW to Straighten the Drawing

Because there are few speckles and no border to remove (using **gCROP**), you can skip despeckling and start deskewing the drawing.

1. Zoom all.

2. Select GTXEnhance>Deskew.

```
No raster image selected. Invoking gACTIVE command
Loading raster -- C:\Program Files\GTX\Raster CAD
V9.1\Sample\gtxmech2.cg4 ...

Select raster <WINDOW>:
```

3. Type **All** to select the entire drawing for deskewing. Press **[RETURN]** to complete selecting raster.

```
Select one end of reference line:
```

4. Type **'rint** to use the "intersection" raster snap mode. Using the **'rint** raster snapping method, select two points on the horizontal centerline that bisects the largest circle.

5. Select an intersection on this line on the left side of the image.

```
Select other end of reference line:
```

6. Type **'rint** again and select another intersection point on the right side of the same line.

   The selected raster will straighten.

Edit Raster Geometry

Use gCHANGE to Modify a Circle

1. Restore the view named “Change”. The view will zoom to the lower left quarter of the drawing.

The dimensions on the left side of the drawing show the large hole in the center of the drawing to have a diameter between 2.2400 and 2.2409 inches.

2. Use the AutoCAD **DIST** command to measure the diameter of the circle. It appears to be roughly 1.5”, so it is not to scale. You will use the **gCHANGE** command to modify the radius to 1.12”, half of the stated diameter, 2.2400”.

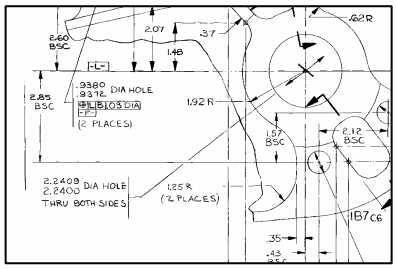
3. **ZOOM** close to the circle.

4. Select GTXEdit>Change.

```
Select raster <LINE>:
```

5. Type **C** for **Circle**.

```
Select point on circumference of
circle:
```



6. Select a point on the circle.

```
Select second point for circle:
```

7. Select another point on the same circle.

```
Select third point for circle:
```

8. Select a third point, as far from the other two as possible. The raster circle highlights.

```
Enter circle radius:
```

9. A line will rubber-band from the center of the circle. You can either select a point or enter a value to indicate the new radius. Type: **1.12**

The circle will stretch to the specified radius.

Use gCHANGE to Modify a Line

The dimension indicating the circle diameter should be modified. First, extend the diagonal line that connects the circle with its dimension text, as shown below:

1. Press **[RETURN]** to reselect **gCHANGE**.

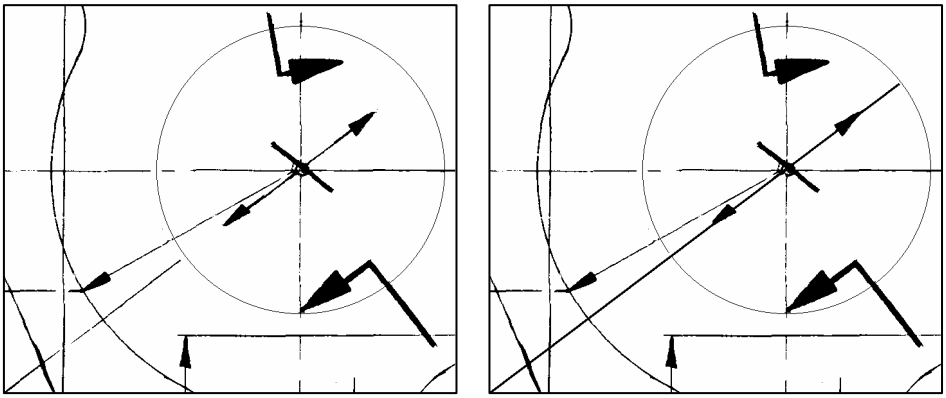
```
Select raster <CIRCLE>:
```

2. Type **L** for **Line**.

```
Select one end of reference line:
```

3. Type **'rend** and select the lower left end of the line that is extending from the circle.

```
Other end of line:
```



4. Use **'rend** again to select the present upper-right point of that line.

```
Select new endpoint:
```

5. Use **'rnea** to select the point on the circle opposite from where the dimension line enters it. The line will now be extended across the circle.

Now that the line is fixed, you will use **gMOVE** to move the small arrowheads to the edge of the circle.

6. Select **GTXEdit>Move**.

```
Select raster <WINDOW>:
```

7. Draw a window around the upper-right arrowhead large enough so that you include some of the line running through it.

8. You will now remove the shaft of the arrow from the selection set. Type **R** for **Remove**.

```
Remove raster <WINDOW>:
```

9. Type **L** for **Line**.

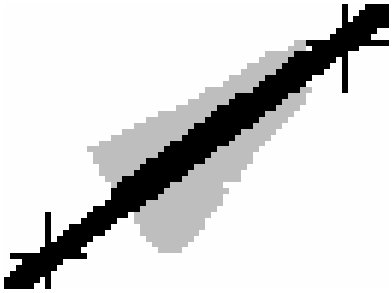
10. You will select two points on the line on either side of the arrow, removing the line from the selection set while leaving the triangular arrow.

```
Select one end of reference line:
```

11. Select the first point above and to the right of the arrow.

```
Select other end of reference line:
```

12. Select the second point on the line below and to the left of the arrow.



```
Remove raster <LINE>:
```

13. Press **[RETURN]** to finish selecting raster.

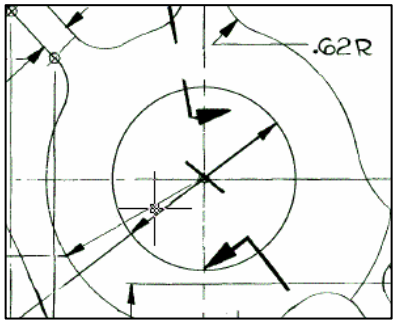
```
Base point or displacement:
```

14. Select a point near the tip of the arrow.

```
Second point of displacement:
```

15. Use **'rint** to select the intersection of the line and the upper right edge of the circle. The arrow will move to touch the inside of the circle.

16. Now move the other arrow down to the lower left edge of the circle so it appears as shown below. Be careful in selecting the arrowhead so you do not accidentally move the nearby leader line:

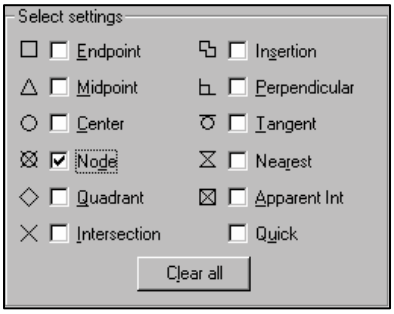


Converting Raster to Vector

You will now convert some of the raster geometry into AutoCAD vector entities using GTXRaster CAD commands.

Use the “Edge” Raster Snap to Draw a Solid

Zoom in on the circle to see the two large arrowheads.



Note ***If you are running GTXRaster Tools, skip to step 5. If you are running GTXRaster CAD, GTXRaster R2V or GTXRaster CAD PLUS, proceed with steps 2 through 4. You can determine which product you are running with the gINFO command.***

Select **Control-Right Mouse Button**. A pop-up menu appears. Select **Raster AutoSnap ON**. This enables AutoCAD AutoSnap™ to "object-snap" to GTX raster data.

Invoke AutoCAD's **OSNAP** command.

Select only **NODE** object snapping setting. **NODE** will cause GTXRaster CAD to snap to the edges of solid raster areas.

Make sure that **Object Snap On** is checked.

Press **OK**.

5. Use the AutoCAD **SOLID** command to trace the large arrowheads. Select three points, then press **[RETURN]** for the fourth point to complete a solid triangle. (Do not select a fourth point).

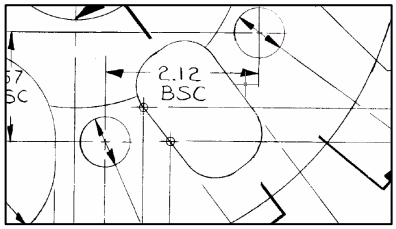
6. Perform this process for both arrowheads.

Note ***You will have drawn two AutoCAD Solid triangular entities representing the arrowheads. If your raster data is the same color as vector objects, then these arrowheads may be difficult to see. If this is the case, zoom all, select the raster object by clicking on its frame, and change its color to red. Then use AutoCAD's REGEN command. The arrowheads will be very visible against the now red raster data.***

Use the "Nearest" Raster Snap to Draw a Polyline

1. **Zoom** in on the irregular hole in the lower right section of the drawing, as shown below.

2. If you performed the AutoSnap steps above, use the **OSNAP** command and select **NEAREST** and **END**. If you are running GTXRaster Tools, continue without performing this step.



3. Use the AutoCAD **PLINE** command to trace the irregular hole. When you are almost done digitizing the hole, type **C** to **Close** the polyline.

4. If you were using AutoCAD's AutoSnap™ on raster, de-activate it by selecting **OSnap/Clear All**. Then, use **Control-Right mouse button** and select **Raster AutoSnap OFF**.

Use gTRACE **to Convert a Raster Line to Vector**

1. Select GTXConvert>Trace Vectors.

2. Select raster <LINE>:

3. Select the tip of the left arrow that extends out of the irregular hole you just traced, then the right end of the arrow's shaft. GTXRaster CAD will draw an AutoCAD line over the raster line, but not over the arrowhead itself.

4. Likewise, trace the right-hand dimension arrow shaft.

Use gRUB **to Erase all Raster Underlying Vector Entities**

Now you will erase the raster under the new vector entities.

1. **Zoom All** so you can see all the vector entities drawn since step 1.

2. Select **GTXEdit>Rub**.

```
Select objects:
```

3. Select **all** the vector entities and press **[RETURN]**.

   The raster underlying the entities will be erased.

4. Select **File>Save** to save both the drawing (vector) and raster files.

Combining Raster Drawings

Now you will add another view of this device into the drawing.

Use gPASTE **to Insert a Raster Image**

You will now paste the new view, called **Side**, into the raster image.
Select **GTXEdit>Paste**.

```
Source File/<Buffer>:
```

1. Type **F** for **File**. The file dialog will appear:

2. Select C:\Program Files\GTX\Raster CAD V9.1\Sample\SIDE.CG4.

```
Insertion point:
```

3. Type: 20,20

```
Loading raster -- C:\Program Files\GTX\Raster CAD
V9.1\Sample\side.cg4 ...
Move/Rotate/Scale:
```

The side view will reappear above and to the right of the detailed top view, but it is rotated 90 degrees. **gPASTE** lets you adjust the pasted data.

4. Type **R** for **Rotate** and the pasted image will be highlighted.

```
Base point:
```

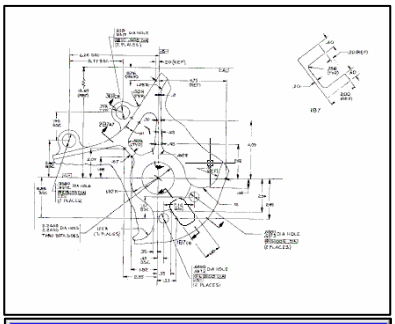
5. Select a point in the middle of the pasted raster data.

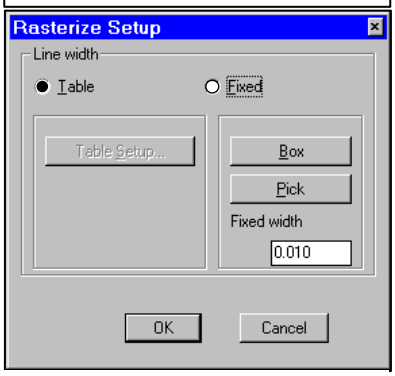
```
Rotation angle <90.0>/Reference:
```

6. Enter **-90** to rotate the image upright.

```
Move/Rotate/Scale:
```

7. Complete the **gPASTE** command by pressing **[RETURN]** at the Move/Rotate/Scale prompt.

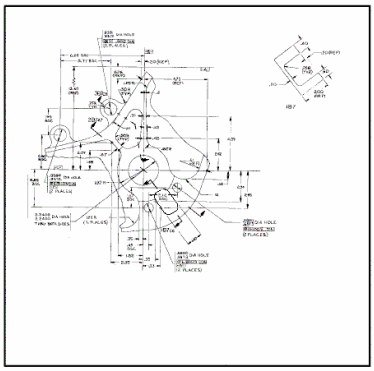




Making a Frame

You will now draw a frame around the drawing. A vector line would look rather thin, but it could be rasterized to make a frame using thicker lines.

1. Draw an AutoCAD **Rectangle** around the drawing but inside the raster boundary.



2. Select GTXConvert>Rasterize.

```
Select objects:
```

3. Select the rectangle. Press **[RETURN]** to complete the selection.

4. Select **Box**.

```
Select first corner of box:
```

5. Select a point on the lower edge of any horizontal line.

```
Select opposite corner of box:
```

6. Move the cursor along the line and slightly above it to make a long thin horizontal window, simulating the line for the frame. The length of the box does not matter; the shortest side of the box provides the final width of the raster.

Notice that the value in “Fixed Width” has changed; this is the width you specified with the box.

7. Select **OK**. The frame will be redrawn in the raster image with thick lines.

Save the Drawing

1. Issue the AutoCAD **Quit** command.

2. Select **Yes** when you are prompted to save the changes.

This saves both the drawing and raster.

Loading Hybrid Drawings

1. Run GTXRaster CAD again so you can load all the information back into GTXRaster CAD at once.

2. Select **File>Open** from the menu:

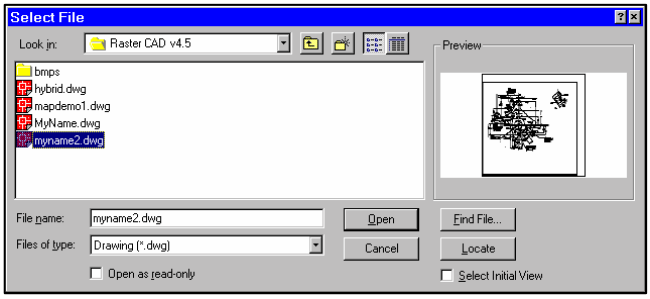
3. Select C:\Program Files\GTX\Raster CAD V9.1\<Your Initials>.DWG as the filename.

AutoCAD will load the vector file and will also display the attached raster image.

What You've Learned

Congratulations! You have now completed the second tutorial lesson. You have learned to use:

- **gATTACH** to load a drawing.
- **gCHANGE**, **gMOVE** and **gRUB** to modify raster geometry.
- **gCOORDS** to adjust the scale of a raster drawing (gCOORDS is an AutoLISP routine that can be loaded).
- **Raster-snapping** to select precise points in the raster image.
- **gTRACE** to convert raster geometry to vector entities.
- **gSAVE** to save specific raster images.
- **END** to save any modified raster images.
- **Open** to load hybrid raster and vector drawing files.



Lesson 3: Raster to Vector

This lesson uses commands available only with GTXRaster CAD *PLUS* and GTXRaster R2V. If you are running GTXRaster Tools, skip this tutorial.

When a drawing needs more than a few minor modifications it can be worthwhile to convert it entirely to vector format. GTXRaster CAD *PLUS* provides powerful tools for accomplishing this quickly and accurately.

Summary of GTX Conversion Commands:

Command	Icon	Program	Action
gTRACE	None	GTXRaster CAD, GTXRaster CAD R2V or GTXRaster CAD PLUS	Converts specified raster lines, arcs and circles to vector. Leaves raster intact.
gVECTOR	None	GTXRaster CAD, GTXRaster CAD R2V or GTXRaster CAD PLUS	Replaces specified raster lines, arcs and circles with vector ones.
gECONVRT		GTXRaster CAD R2V or GTXRaster CAD PLUS	Vectorizes the raster edge created in raster mode.
gCONVRT		GTXRaster CAD R2V or GTXRaster CAD PLUS	Converts selected raster data into lines, arcs, circles and arrowheads or polylines.
gTCONVRT		GTXRaster CAD R2V or GTXRaster CAD PLUS	Converts selected raster text into AutoCAD text entities.

Loading a Raster File

1. Invoke the AutoCAD **NEW** command. The **Create New Drawing** dialog will appear.

2. Select **Start from Scratch** and choose English (feet and inches).

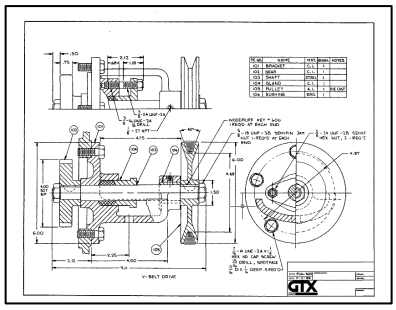
3. Select **GTXImaging>Quick Attach**.

4. Select *Gtxvbelt.cg4* from the GTX program directory and press **OK**. The image was scanned sideways, so the image must be turned 90 degrees back to normal!

5. Is GTXVBELT rotated? If so, select **GTXEnhance>Turn**. Otherwise, skip to step 7.

```
Specify rotation angle <90>/180/270:
```

Note: ***gTURN helps when images are scanned in sideways because it quickly rotates them to the correct angle.***



6. Press **[RETURN]** to accept the default 90 degree rotation.

The raster data is rotated 90 degrees while leaving the lower left corner at 0,0 and the orientation at 0 degrees.

Use gCONVRT **to Convert Raster to Vector**

First, you will convert the table in the upper right corner to AutoCAD lines.

PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKET	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	
105	PULLEY	A.I.	1	DIE CAST
106	BUSHING	BRO.	1	

1. Zoom in on the table in the upper right corner of the drawing.

2. Select GTXConvert>Vectorize.

```
Select raster <WINDOW>:
```

3. Type **F** for the **Fence** raster picking method.

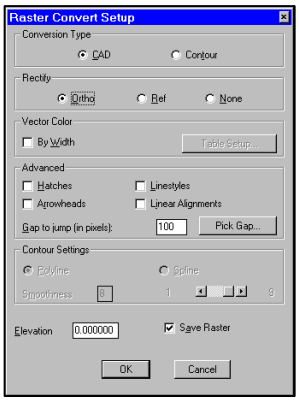
```
First fence point:
```

4. Draw a short line across one of the table grid lines without touching any raster text.

```
Undo/<Endpoint of line>:
```

5. Press **[RETURN]** to finish drawing the fence line. This will select the entire grid without selecting the enclosed text.

```
Select raster <Fence>:
```



6. Press **[RETURN]** again to finish selecting raster. The **Raster Convert Setup** dialog will appear (See **gCONVRT**, page 126).

7. Make sure the **Vector Color>By Width** checkbox is empty. This will ensure that the resulting vectors are generated with the current layer's color and linestyle.

8. Verify that **Rectify Ortho** is selected. This will snap nearly orthogonal lines to 0 and

90 degrees.

9. Un-check **Save Raster** so the original raster will be replaced with the resulting vector entities.

10. Select **OK**.

```
Processing Image...
```

The table will be converted to AutoCAD line entities.

PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKET	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	
105	PULLEY	A.I.	1	DIE CAST
106	BUSHING	BRO.	1	

11. Use the AutoCAD **LIST** command to check a few of the resulting lines. Verify that the raster lines were snapped to exactly vertical or horizontal orientations when they were converted to vectors ("Angle in XY Plane = 90, 180, or 270").

Converting Raster Text to AutoCAD Text Entities

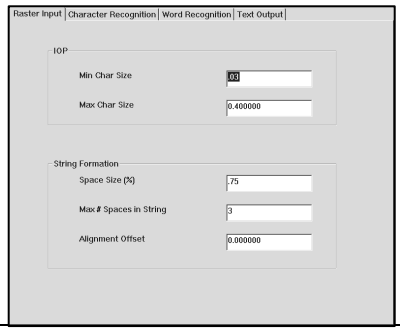
gTCONVRT converts selected raster text into AutoCAD text entities. If a raster text character is drawn poorly or if it is ambiguous (i.e., it looks very much like another character) the command will require you to verify it using the **Character Verification** dialog.

USING GTCONFIG TO CONFIGURE THE TEXT RECOGNITION

Read the command references for the **gCONVRT**, **gTCONVRT**, and **gTCONFIG** commands.

1. Select **GTXConvert>Text Convert**. Because you have not yet configured text conversion, the Text Configuration dialog appears. This dialog sets up the details required to convert raster text into AutoCAD text entities. The dialog contains four panes: Raster Input, Character Recognition, Word Recognition and Text Output. The dialog starts on the first pane, Raster Input.

Raster Input Pane



The **IOP** section limits the range of text sizes that can be selected using text window IOP or text line IOP. It also limits the size of distinct raster entities that can be processed by **gTCONVRT** as text. Set the **Min Char Size** slightly lower than the size of small punctuation marks (“.”). This insures that punctuation marks, but not speckles, will be converted.

Note: ***In speckled drawings you should use the gSPECKL command before doing any conversion. This tutorial skips speckle removal because this drawing has few speckles.***

Because text characters are sometimes touching, it is good to set the **Max Char Size** slightly larger than two times the size of a typical large character.

1. Set the **Min Char Size** to **.03** (the default value of .04 won’t select all the decimal points in this table).

2. Leave the **Max Char Size** at “.4”. This should work fine for this drawing because most text characters are only about .2” tall (you can use the AutoCAD **DIST** command to sample text sizes first).

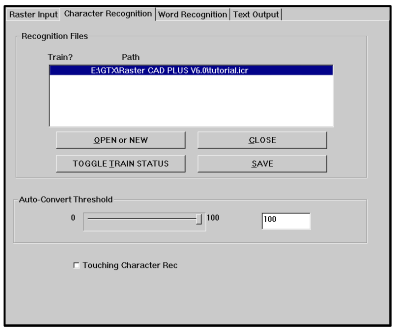
The **String Formation** section controls how AutoCAD text entities are formed from individual raster characters. **Space Size** represents the distance (in terms of the portion of a character’s width) between two raster characters required to insert “space character” between them. **Max # Spaces** represents the maximum number of space characters allowed before the characters need to be split into two separate AutoCAD text entities. **Alignment Offset** represents the vertical offset allowed between two characters that are of the same text string.

3. Looking at the third and fourth columns of the table, you can see that the space between text strings can be even less than one character’s width. Set the **Space Size** to **.75**.

4. Leave **Max # Spaces** at “3” so that several space characters can be fit between two characters. If **gTCONVRT** finds more than 3 spaces between two characters they will be separated into separate text entities.

Character Recognition Pane

Select the **Character Recognition** tab. The **Recognition Files** section controls which recognition files (suffix = *ICR*) are being used to recognize the raster text. Recognition files contain sample raster text which is compared to the text being converted, so it is important to choose file(s) whose samples best match the raster text being converted. For this tutorial you will use the file: *TUTORIAL.ICR*.



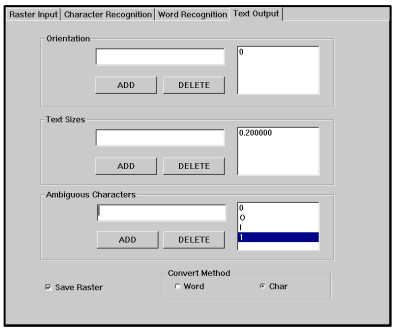
1. Select the button labeled **OPEN or NEW**. A file dialog appears.

2. Select *Tutorial.icr* from the GTX program directory and press **OK**.

The **Auto-Convert Threshold** determines the **confidence level** at which a character must be recognized for **gTCONVRT** to automatically convert it to an AutoCAD text entity. Characters recognized at confidence levels below the Auto-Convert Threshold will be displayed in the Character Verification dialog before they are made into text entities. The default value for the Auto-Convert Threshold is “100”. Leaving it at this value would force the Character Verification dialog to appear for every character. Instead, set this value to **85**. Characters recognized at a confidence above 85 will be automatically converted into text entities.

Text Output Pane

The **Orientation** list contains all orientations allowed for resulting text entities. The default orientation is “0” and this will work because all the raster characters in the drawing are upright.



The **Ambiguous Characters** list on the Text Output pane displays all characters that, even when drawn clearly, can be confused or mistaken as another character. In this drawing, the letter “O” and the numeral “0” (zero) or the letter “I” (capital i) and the numeral “1” (one) appear identically in this drawing. Adding these to the **Ambiguous Characters** list will make **gTCONVRT** verify these characters with you before it builds them into AutoCAD text strings. This way, if a “0” is recognized as an “O”, you can prevent **gTCONVRT** from accidentally mistaking the letter O as a zero, or a 1 as the letter I.

Click in the small text box (on the left in the **Ambiguous**

Characters section).

3. Type: **0** (zero).

4. Select **Add**. “0” appear to the right in the Ambiguous Characters list box.

5. Type: **O** (Capital O).

6. Select **Add** again. “0” and “O” should be in the list box to the right.

Similarly, add “I” and “1” to the Ambiguous Characters list.

8. AutoCAD text will be snapped to the nearest size listed in the **Text Sizes** list. Leave the value at its default of **.200000**. This way only text of height .2” will be generated.

The **Save Raster** option preserves the original raster as it is converted to text. Leave this box checked so you can compare the new AutoCAD text with the original raster text after the **gTCONVRT** command is finished.

Set the **Convert Method** on **Char** instead of **Word**.

11. Select **OK** to finish configuring text recognition.

Now that you have configured text recognition, **gTCONVRT** will proceed.

Use gTCONVRT **to Recognize Raster Text**

```
Select raster <FENCE>:
```

1. Type: **textwin** to invoke the text window IOP.

```
Select first corner of window:
```

2. Select a point above and to the left of the table.

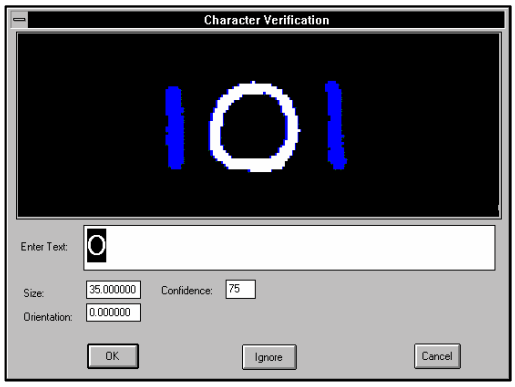
```
Select opposite corner of
window:
```

3. Select a point below and to the right of the table.

```
Select raster <TEXTWIN>:
```

4. Press **[RETURN]** to stop selecting raster.

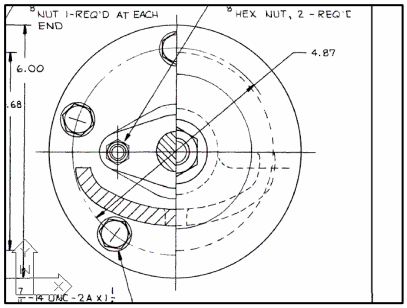
```
Processing Image...
```



5. The Character Verification dialog will appear for each ambiguous character and for each character recognized at a confidence level below that of the Auto-Convert Threshold:

6. Each ambiguous character; “O”, “0”, “1”, and “I”; will appear for verification.

   If a character appears and is correct, press **[RETURN]** to accept **gTCONVRT**’s evaluation of the character.



- If two characters appear connected together (touching text), type both characters and press **[RETURN]**. The raster will be split into the two specified characters.
- If the character is not correct, type the correct character (you may want to activate the **[Caps Lock]**) and press **[RETURN]**.

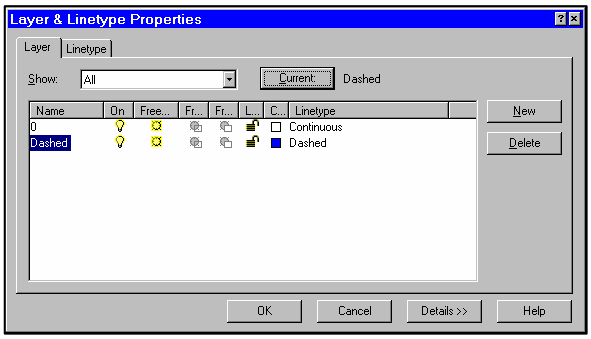
- If non-text raster appears, select **Ignore** to skip converting this character into text.

Once the Character Verification dialog has shown each ambiguous or uncertain character, **gTCONVRT** will create AutoCAD text entities in front of the raster text. This text can be edited using AutoCAD's **Edit>Properties** dialog.

Converting Dashed Raster Data

1. Zoom to the extents.

   Notice the dashed arcs in the lower right corner of the drawing. We will selectively convert the raster arcs to vector.

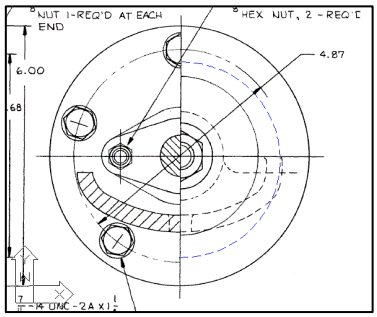


2. Invoke the AutoCAD **Format>Layers...** command.

3. Create a new layer named **Dashed**. Set the linestyle to **Dashed** and set its color to **Blue**.

4. Set "Dashed" as the current layer. Select **OK** to exit the AutoCAD Layer dialog.

4. Zoom in on the lower right corner of the drawing.



6. Select **GTXConvert>Draw Vectors** to invoke the **gVECTOR** command.

```
Select raster <LINE>:
```

7. Type **A** for Arc.

```
Select start point of reference arc:
```

8. Use the **'rint** raster snap to select the point at the intersection of the lower half of the vertical line that bisects the circle and the beginning of the dashed arc. A rubber-banding line should extend from the intersection to the cursor.

```
Select point on arc:
```

9. Use the **'rnea** raster snap to select another point along the middle part of the arc.

```
Select end of reference arc:
```

10. Select a point at or beyond the end of the dashed arc (at or beyond the point where the arc touches the top half of the vertical bisecting line).

11. **gVECTOR** will draw an AutoCAD arc over the original raster arc. The dashes are too big, so set the **Linetype Scale** (ltscale) to **.02** to make the vector dashes match the original raster drawing.

Note: ***Generally, conversion command in the GTXRaster CAD series places resulting vector entities on the current AutoCAD layer, inheriting its properties. The Linewidth Table option assigns specific colors to vectors resulting from associated raster linewidths. Hatch recognition and dashed line recognition place qualifying hatch or dashed line information onto special layers defined in the* GTXRAST.CFG *configuration file.***

What You've Learned

Congratulations! You have now completed the third and last tutorial lesson. You have learned to use:

- **gATTACH** to load a raster file.
- **gCONVRT** to quickly convert a selection of raster to AutoCAD vector entities.
- **gVECTOR** to convert raster geometry to vector entities.
- **gTCONFIG** to configure text conversion.
- **gTCONVRT** to convert raster text into AutoCAD text entities.
- **Raster-snapping** features to achieve accuracy.

Lesson 4: Using Advanced Conversion Features

GTXRaster CAD allows the following advanced conversion features:

- Linestyle recognition
- Hatch recognition
- Spline recognition
- Arrowhead toggle
- Gap Jump Setting

This tutorial will teach you to use these advanced features of the gCONVRT command.

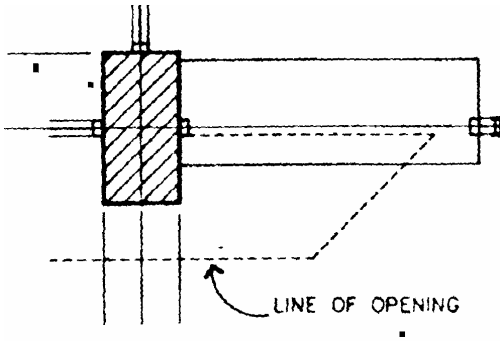
Prepare the drawing

1. gATTACH the tutorial file, *gtxarch.cg4*.

2. gTURN the image 270°.

Deskew the image as described in Lesson 1.

Zoom close into the lower left corner of the image:



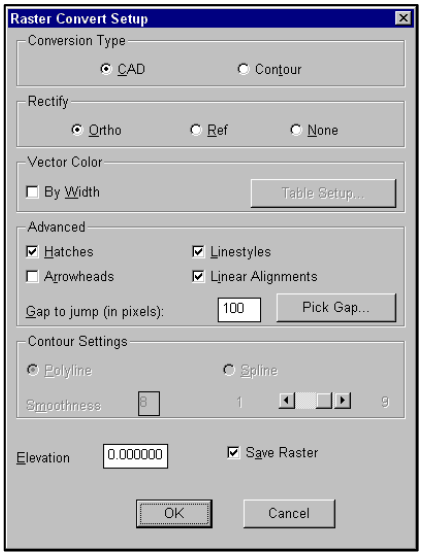
Invoke gCONVRT

```
Select Raster <WINDOW>:
```

Type **V** to select all raster data in the image.

```
Select Raster <WINDOW>:
```

Press [RETURN] to finish selecting raster.



Select **Linestyles**. This will cause **gCONVRT** to put dashed lines and other lines with broken linestyles onto a separate AutoCAD layer. The *LINESTYLE_LAYER_NAME* configuration parameter in the *gtxrast.cfg* configuration file provides this layer's name. In the default configuration file, this name is *LinestyleLayer*, so this layer will be created when gCONVRT runs.

Select **Hatches**. This will cause **gCONVRT** to put hatched lines onto a separate AutoCAD layer. The *HATCH_LAYER_NAME* configuration parameter in the *gtxrast.cfg* configuration file provides this layer's name. In the default configuration file, this name is *HatchLayer*.

```
Hatch angle? <0.00000>/Pick:
```

Type **P** to graphically select the angle from the screen.

```
First point for snap angle:
```

Select one end of a longer hatch.

```
Second point for snap angle:
```

Select the opposite end of the same hatch line.

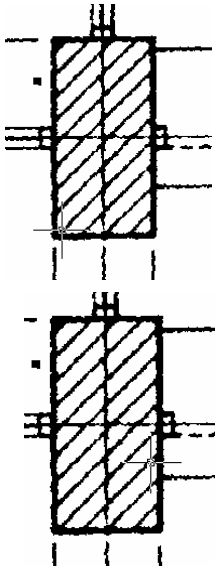
```
Hatch angle? <44.98355>/Pick:
```

Draw a line between two hatch lines to define the distance between them.

```
Hatch angle? <44.98355>/Pick:
```

If you wanted to convert multiple hatches that were at different angles, you could continue entering hatch angles at this point. Because you are converting only one, press **[RETURN]**.

```
Parallel alignment offset <0.0>:
```



Press **[RETURN]**. The **gCONVRT** dialog appears again.

Press **OK** to start the conversion.

The drawing is converted.

SEND RASTER TO BACK

If the image and the vectors are both the same color, then the vectors may not be visible.

1. Select the edge of the image. You may have to zoom out to do this.

2. When the image is selected, change its color from **ByLayer** to **Blue**.

3. Invoke Send Images to Back from the Imaging toolbar.

The resulting vectors are now visible.

LOOKING AT THE CONVERSION RESULTS

1. Invoke AutoCAD's LAYER command.

The two new layers, **HatchLayer** and **Linestylelayer**, appear in the list of layers (these have been defined in the **GTXRAST.CFG** configuration file).

2. Change the color of *HatchLayer* to **Yellow** and *Linestylelayer* to **Red**.

3. Change the linestyle of *Linestylelayer* to Dashed (you may have to LOAD the dashed linestyle before it becomes available).

4. Press **OK** in the Layer & Linetype Properties dialog.

Now the differences between hatched, dashed, and continuous geometry is visible.

Note: ***You can establish layers for raster, dashed geometry and hatched geometry in advanced by creating them in your drawing templates. That way, the items placed on these layers will appear in different colors and linestyles.***

What You've Learned

Congratulations! You have now completed the fourth tutorial lesson. You have learned to use:

- Convert data using **Linestyle** and **Hatch** recognition features.
- Use the **Send Images to Back** feature.

Lesson 5: Using Intelligent Character Recognition

GTXRaster CAD *PLUS* and GTXRaster R2V provide the following advanced character recognition features:

- Touching Text Splitting
- Dictionary Lookup
- Pattern matching
- Word Verification

In Tutorial 3 you learned how to use **gTCONVRT>gTCONFIG** to convert raster text into AutoCAD text one character at a time. This tutorial will demonstrate how to use these new features of the **gTCONVRT** command to convert text word-by-word.

Preparation

gATTACH *gtxvbelt.cg4* from the GTX program directory.

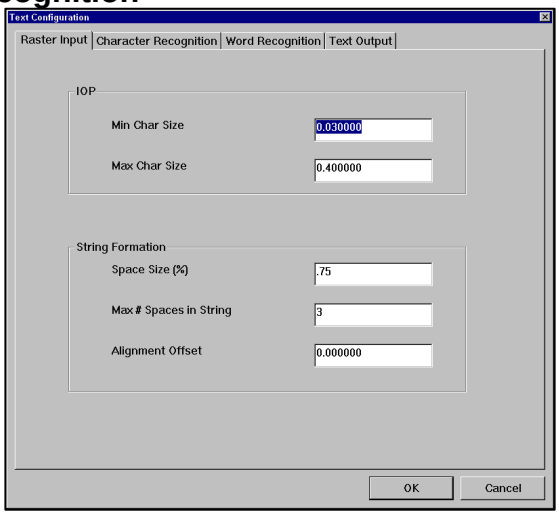
ZOOM to the table in the upper right corner of the drawing.

Configuring Text Recognition

RASTER INPUT PANE

1. Invoke **gTCONFIG** to set up the text recognition parameters.

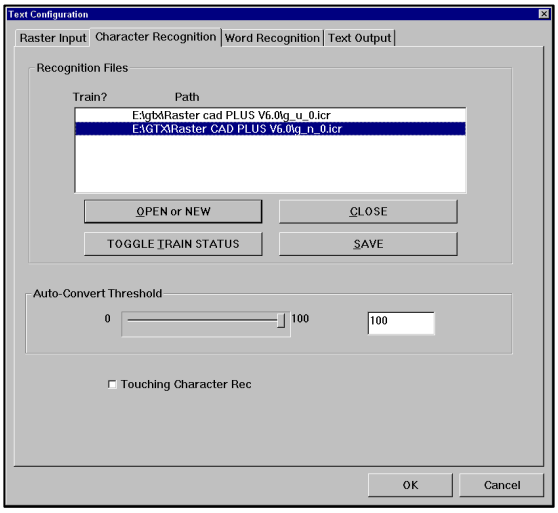
2. The **Raster Input** pane appears first. As in Tutorial 3, set the **Min Char Size** to .03, the **Max Char Size** to .4, **Space Size** to .75, as shown in this illustration:



3. When done, select the **Character Recognition** tab.

CHARACTER RECOGNITION PANE

4. Open *g_U_0.ICR* and *G_N_0.ICR* from the GTX program directory.



5. The **Auto Convert Threshold** is not important because it is not used when performing *Word* recognition.

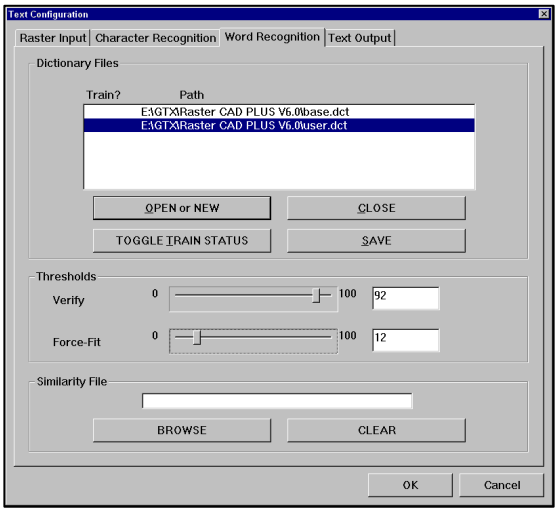
6. Select the Touching Character Rec checkbox.

7. Select the **Word Recognition** tab.

WORD RECOGNITION PANE

The **Dictionary Files** section loads one or more dictionaries the same way the Recognition File section on the Character Recognition pane loads recognition files. Dictionaries (suffix = *.DCT*) are ASCII text lists of words that are likely to appear in your drawings.

8. Load *Base.dct* and *User.dct* from the GTX program directory.



The **Force-Fit** threshold controls how hard ICR should try to match recognized words against dictionary terms and patterns. The **Verify** threshold controls how likely ICR is to show replaced terms to you during conversion.

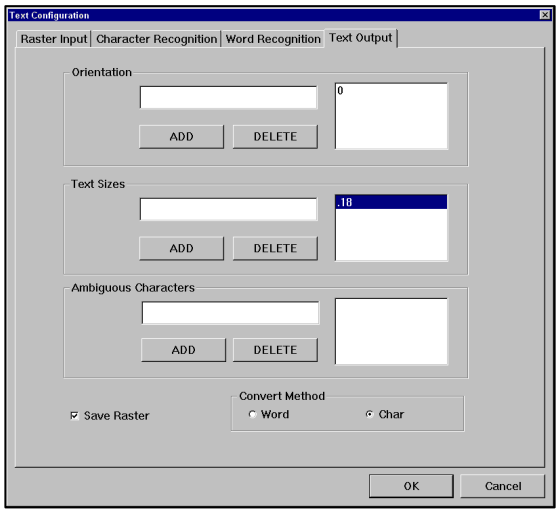
9. Set **Verify** to 92. This means that most recognized words will appear to the user, but that

perfect matches will not.

10. Set **Force-Fit** to 12. This means that most words will be forced to match a dictionary term, but words that are sufficiently unlike any dictionary terms will be left alone.

11. Select the **Text Output** tab.

TEXT OUTPUT PANE



12. Select the .2 under **Text Sizes** and press **Delete**.

13. Set the **Text Sizes** value to **.18**.

14. Set the Convert Method to Char.

14. Press **OK**.

TOUCHING CHARACTER SPLITTING

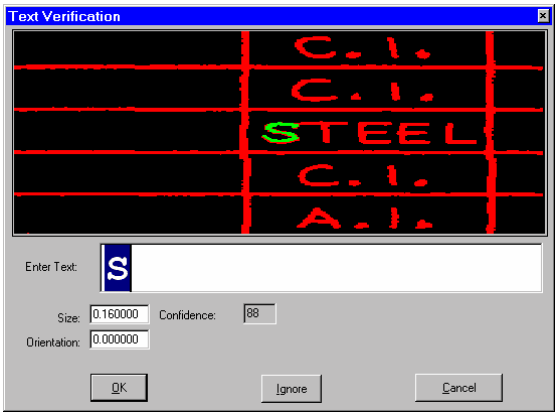
In the raster image, the word, “STEEL” has the letters S and T touching.

16. Invoke **gTCONVRT**.

```
Select raster<WINDOW>:
```

17. Type **INSIDE** and draw a window around the word, “STEEL” in the raster image. Press **[RETURN]**.

18. The Text Verification dialog appears, and the letter “S”



appears separated from the letter “T”. Continue converting the word and you will see how the **touching text splitting** feature helps recognition.

WORD RECOGNITION

19. Erase the vector text object “STEEL”.

20. Invoke **gTCONFIG**.

21. Select the **Text Output** tab.

22. Select **Word** recognition.

23. Press **OK** to exit the configuration panel.

24. Invoke **gTCONVRT**.

```
Select raster<INSIDE>:
```

25. Window around the entire table of raster text. This will highlight the lines as well as the raster text.

26. One by one each word will appear in the **Word Verification** dialog. Correct any incorrect terms and press **[RETURN]**.

Note: ***where the numbers 101, 102, etc. appear, the ambiguity between I and 1 and the O and 0 is being handled by GTX ICR’s pattern matching feature. A pattern has been entered in* user.dct *that reads: \d\d\d, which ICR interprets as “digit digit digit”.***

What You’ve Learned

Congratulations! You have now completed the fifth tutorial lesson. You have learned to use the new Intelligent Character Recognition features included in GTXRaster R2V and GTXRaster CAD *PLUS*.

Command Reference

This section defines the GTXRaster CAD series commands and features. The first few pages include new and changed commands, a set of overview tables listing each command and feature with icon and brief description. Read detailed command descriptions through the rest of the section, indexing along the top margin of the page to find each command name.

Command Overview

Icon	Command	Short	Description
	gACLEAN	GACL	Automatically deskews and deletes noise in the active image.
	gACTIVE	GAC	Prepares a selected image as the active image, ready for raster editing or conversion
	gADESKEW	GAD	Automatically rotates the current raster image to align raster to an orthogonal orientation.
	gARC		Draws a raster arc in the current raster image
	gAUTOSNAP	GAS	Enables AutoCAD's AutoSnap™ options within active image entities
	gARRAY	GAR	Creates a circular or rectangular array from selected raster data

	gATTACH	GA	Quickly loads raster images
	gBITONAL	GBIT	Automatically reduces a color image to a binary (1-bit) image
	gBURN	GBU	Converts all vectors to raster, “burning” them into the current raster image
	gCALIKE	GCA	Changes circles and arcs to have the same radius as a selected circle or arc
	gCELEV	GCE	Assigns incremental elevations to multiple polylines
	gCHANGE	GCH	Changes the size or position of a line, arc or circle
	gCHGLAY	GCHL	Changes the layer of objects to that of a specified object
	gCIRCLE	GC	Draws a raster circle in the current raster image
	gCLEANIOP		Automatically deskews the active image and places speckles and other noise in a selection set
	gCONCEN	GCONC	Moves circles and arcs to be concentric about a location or about the centerpoint of a specified circle or arc

	gCONVRT	GCO	Converts selected raster data to vector
	gCOPY	GCP	Copies selected raster data to a new location on the image, retaining the original
	gCAI		Copies all images using the AutoCAD COPY command
	gCREATE	GCR	Creates a new raster database or flush the current raster database
	gCROP	GCRO	Deletes all information outside of a specified window
	gCUT	GCU	Copies selected raster data to a file or buffer
	gDESKEW	GD	Aligns raster data in current raster image to 0 and 90 degrees
	gDRO_BK		Sets all image entities' draw order behind other entities
	gECONVRT	GEC	Creates a vector edge around selected raster
	gEDGE	GED	Creates a raster edge around selected raster
	gERASE	GE	Removes selected raster data

	gFRZLAY	GFR	Freezes the layer of a specified object
	gHELP	GH	Launches the online help
	gINFO	GI	Displays information about the raster database
	ImageFrame		Configures the AutoCAD Image Frame
	ImageTransparency		Controls AutoCAD image transparency
	gINACTIVE	GINA	Deactivates the currently active image, freeing memory
	gINVERT	GIN	Reverses the raster foreground and background data Useful for raster scanned from negative images
	gISOLAY	GISL	Freezes all layers except that of a selected object
	gJOIN	GJO	Joins lines
	gLINE	GLN	Draws lines on current raster image
	gMIRROR	GMI	Mirrors selected raster data
	gMOVE	GM	Moves selected raster data

	gMAI		Moves all images using the AutoCAD MOVE command
	gOFFSET	GOFF	Creates concentric raster circles, parallel raster lines and parallel raster arcs
	gOSR		Invokes GTX OSR for doing batch raster-to-vector conversion
	gPASTE	GP	Pastes raster data from a raster file or a buffer created with gCUT
	gRAHEAD	GRAH	Erases “arrowheads” (solids with three points)
	gRASTER	GRA	Converts selected vector entities to raster
	gREFLCT	GREF	Mirrors the entire image in either the X or Y axis, replacing the original image
	gRELIMIT	GREL	Combines trim and extend for lines
	gRESIZE	GRE	Resizes the image entity (Adds or removes pixels without scaling the image entity)
	gROTATE	GR	Rotates selected raster data
	gRAI		Rotates all images using the AutoCAD ROTATE command

	gREDUCE	GRED	Reduces a multi-color image to a more manageable number of colors
	gRUB	GRU	Erases raster data under selected vector data
	gSAI		Scales all images using the AutoCAD SCALE command
	gSAVE	GSA	Saves the raster image
	gSCALE	GS	Scales selected raster data
	gSEPARATE	GSEP	Separates colors to discrete bitonal images
	gSETLAY	GSL	Sets the current layer to that of a specified entity
	gSMOOTH	GSM	Smoothes selected raster. This feature is now available under GTXRaster CAD and higher levels of the software
	gSPECKL	GSP	Perform raster object speckle removal to selectively erase background noise or fill in holes in the raster image
	gTCONFIG	GTCFG	Configures Text Window IOP, Text Line IOP and the gTCONVRT/gTRAIN commands

	gTCONVRT	GTC	Converts raster text to AutoCAD text entities
	gTRACE	GT	Traces vector lines, arcs, and circles over selected raster geometry (raster is preserved)
	gTRAIN	GTR	Previews and edits text recognition files used by gTCONVRT.
	gTRANS_ON		Makes all images transparent
	gTURN	GTU	Reorients the work area (and image) by 90, 180 or 270 (-90) degrees
	gVECTOR	GV	Traces raster to vector lines, arcs and circles.
	gVSKEW	GVS	Deskews vector data
	gWARP	GW	Corrects distortions in an image

Raster Picking Options

Most commands affect a subset of the raster image. To **gMOVE** a raster circle, you need to first pick that circle. The GTXRaster CAD series uses **Intelligent Object Picking** (IOP) to pick raster entities from the drawing as if they were intelligent CAD entities. These options can be typed, found in the **GTX Edit>Raster Pick**, the toolbar or the screen menu.

The following list describes each IOP option:

Icon	Pick Option	Short	Description
	ADd	ADD	Add data to the selection set (after using “remove”)
	Remove	R	Remove selected data from the selection set
	ALL	ALL	Select all raster on the current raster image
	AllText		Selects (or deselects) all text in the current raster image
	Window	W	Select all raster within a rectangular window
	PWindow	PW	(Polygon Window)
	CRossing	CR	Select connected raster objects that are completely contained by or crossing the edge of a window
	PCrossing	PC	(Polygon Crossing) Select raster that is completely contained by or crossing the edge of a polygon
	Inside	I	Select raster objects completely contained by a window
	PInside	PI	Select connected raster objects that are completely contained by a polygon.
	Fence	F	Select connected raster objects that are intersected by a polyline
	Object	O	Select contiguous raster data within the current view
	ARc	AR	Select raster arcs under a reference arc
	2 Pick Circle	2P, 2PC	Select raster circle using a 2-point reference circle
	CIrcle	CI	Select raster arcs or a circle under a reference circle
	Line	L	Select raster lines under a reference line
	PRevious	PR	Pick the objects in the previous selection set

Icon	Pick Option	Short	Description
	Segment	S	Selects a linear raster segment in both directions from a pick until it stops or finds an acute angle or a branch
	TEXTLine	TEXTL	Select text-sized raster elements that are intersected by a reference line. Separates text from touching raster elements
	TEXTWindow	TEXTW	Select raster text elements that are within a rectangular window. Separates text from touching raster elements
	unDer	D	Pick raster under selected vector objects
	Undo	U	Remove data from the selection set added by the last pick made
	View	V	Select all raster data within the present view

Raster Object Snapping Options

The GTXRaster CAD series provides transparent “raster snaps” similar to but independent from AutoCAD object snaps. While using an AutoCAD or GTX command, select Control-Right-mouse button to choose raster snaps from a pop-up menu.

In addition to transparent raster snaps, the GTXRaster CAD series includes the **gAUTOSNAP** command, enabling AutoCAD’s **Endpoint**, **Intersection**, **Nearest** and **Node** AutoSnap™ methods within active raster entities. The following table lists each raster snap option.

Icon	Name	Keyboard	Description
	None	rnone	Disables previous snap mode settings
	Endpoint	‘rend	Snaps to the nearest end of a raster entity
			Endpoint activates as running snap under AutoCAD’s End AutoSnap™.
	Intersection	‘rint	Snaps to the intersection of two or more raster entities
			Intersection activates as running snap under AutoCAD’s Intersection AutoSnap™.
	Nearest	‘rnea	Snaps to the centerline of the nearest raster object

			Nearest activates as running snap under AutoCAD's Nearest AutoSnap™.
	Edge	'redge	Snaps to the edge of the nearest raster object.
			Edge activates as running snap under AutoCAD's Node AutoSnap™.
	Center	'rcen	Snaps to the center of a circle or arc defined by three raster points
	Tangent	'rtan	Snaps to the point that, with the previous point, makes a line tangent to a circle or arc defined by three raster points. The first point defines the side of the circle or arc for the tangent
	Midpoint	'rmid	Snaps to the midpoint of a line defined by two raster points
	MidArc	'rmida	Snaps to the midpoint of a raster arc defined by the endpoints and a circumference point
	Perpendicular	'rper	Snaps to a point where the present entity being drawn will intersect perpendicular to a line defined by two points
	Perp-Arc	'rpera	Snaps to the point perpendicular to an arc defined by three raster points

Command Definitions

This section defines each command. The AutoCAD variables control the use of dialog boxes or prompts for many commands. FILEDIA controls dialogs for file commands and CMDDIA controls dialogs for other commands. Setting these variables to "1" enables the dialogs. Setting the variables to "0" disables dialogs and causes these commands to use AutoCAD command line prompts.

gACLEAN

Type	Menu	Availability
GACLEAN GACL	GTXEnhance>Auto clean	GTXRaster CAD GTXRaster R2V GTXRaster CAD PLUS

Icon:

gACLEAN automatically deskews the image and removes noise and speckles without forming a selection set; it is completely automatic. Another command, GCLEANIOP is interactive, forming a selection set that can be modified before erasing the noise.

Instructions:

Issue the Clean IOP command. The program will automatically deskew the image and delete noise.

NOTE If you are concerned about losing information from your drawing, you may use gCLEANIOP instead

gACTIVE (Active Image)

Type	Menu	Availability
GAC	GTX Imaging>Active Image	All Products

Icon:

Every raster editing/enhancing command requires an active image to be specified. The **gACTIVE** command is invoked automatically when there is none specified, so you won't explicitly invoke this command unless you are working on more than one image at a time and wish to switch from one to another.

gACTIVE sets active images to transparent.

Options:

Number of Images

Note: ***Invoke gINACTIVE to make an active image inactive and save memory. CLIPPING only masks the DISPLAY of images. When editing a clipped image, the entire image is being edited (selections include clipped portions of an image, but after the edit, the clipping is still active).***

The behavior of **gACTIVE** varies depending on the number of images currently attached to the AutoCAD drawing:

One Image: If there is only one image currently attached, **gACTIVE** will automatically set it as the active raster image.

Two or More Images: If there are two or more images, a prompt will request that you select the one to edit.

Image Type

gACTIVE behaves differently depending on the number of images attached.

Bi-Tonal: Bi-tonal images are activated quickly and easily.

Color or Grayscale: Color or grayscale images are reduced to bi-tonal (two colors) before becoming active. The color or grayscale image is not modified; rather, the command generates a bitonal version of the original.

gADESKEW

Type	Menu	Availability
GAD or GADESKEW	GTX Enhance>Auto Deskew	GTXRaster CAD, R2V & GTXRaster CAD PLUS

Icon:

Drawings are often scanned in slightly rotated. **gADESKEW** straightens a raster image by automatically rotating it to align with the X or Y axis.

Instructions:

1. Select **gADESKEW**.

```
Deskew Entire Image?
```

3. The deskew will take place, based on long raster lines found in the margin of the raster image. If no such lines are found, they will not deskew.

gARC

Type	Menu	Availability
GARC	GTX Edit>Draw Arc	All Products

Icon:

Draws a raster arc in the current raster image

Instructions:

gARC

Enter or accept line width

Start point:

Select or type the first endpoint.

Middle point:

Select or type a second endpoint.

End point:

Select or type a third endpoint.The arc appears after the third point is specified.

Note: If there is no active image, gACTIVE will be invoked before continuing with gARC. If there is no image attached gCREATE will be invoked to set up an image into which raster line can be drawn.

gARRAY

Type	Menu	Availability
GAR or GARRAY	GTX Edit>Array	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gARRAY copies raster data in rectangular or polar arrays. When creating a rectangular array, gARRAY arranges multiple copies of the selected raster in rows and columns. When creating a polar array, the command arranges copies of the selected raster placed about a circle.

Instructions:

1. Invoke gARRAY.

```
Select raster <Window>:
```

2. Select the raster data to be copied. Use any valid raster selection method.

3. Press **[RETURN]**.

```
Rectangular or Polar array (R/P) <R>:
```

4. Enter **R** for rectangular or **P** for polar.

Rectangular

If using a rectangular array you must specify the number of rows and columns to be copied.

```
Number of rows (---)<1>:
```

a. Enter the number of rows you desire.

```
Number of columns (|||)<1>:
```

b. Enter the number of vertical columns you desire.

```
Unit cell or distance between rows (---):
```

c. You may enter a vertical distance numerically or draw a “unit cell” representing the distances between rows and columns graphically. If you enter a distance numerically then press **[RETURN]**, you will receive the following prompt:

```
Distance between columns (|||):
```

d. Enter the distance that will separate the columns. The selected raster is copied.

Note: Positive x or y distances places copies to the right or above the original. Negative distances places them to the left or below the original.

If you drew a unit cell instead of typing a distance, a rectangular box will rubber-band from the anchor point. Drag the box to represent the distance between both the rows and columns. The selected raster is copied.

Polar

If using a polar array you must specify the center point of the array, the number of copies, the angle to fill and whether or not to rotate the raster data as it is copied around the polar array.

```
Center point of array:
```

a. Select a point that represents the axis around which all selected data will be copied.

```
Number of items:
```

b. Enter the number of items that will fill the angle you will specify.

```
Angle to fill (+=ccw,-=cw)<360>:
```

c. Enter an **integer** value representing the angle over which the copies will be evenly distributed.

```
Rotate objects as they are copied? <Y>:
```

d. Respond **Y** to rotate the objects as they are copied. This will keep the raster objects in the same orientation to the center point as they are copied. Responding **N** will keep the raster objects in the same orientation as the original raster object selected.

The raster data is copied.

gATTACH

Type	Menu	Availability
GA, GATTACH	GTX Imaging>Quick Attach	All Products

Icon:

gATTACH loads an image into AutoCAD with fewer steps than used in AutoCAD's IMAGE command.

Instructions:

Select **gATTACH**.

The **gATTACH** file dialog will appear.

Select the appropriate file type in the "List Files of Type:" combo-box, select the directory in which the file resides. All files of the indicated type will appear in the "File Name" box. Select the file you wish to load and press OK.

Loading a Raster File

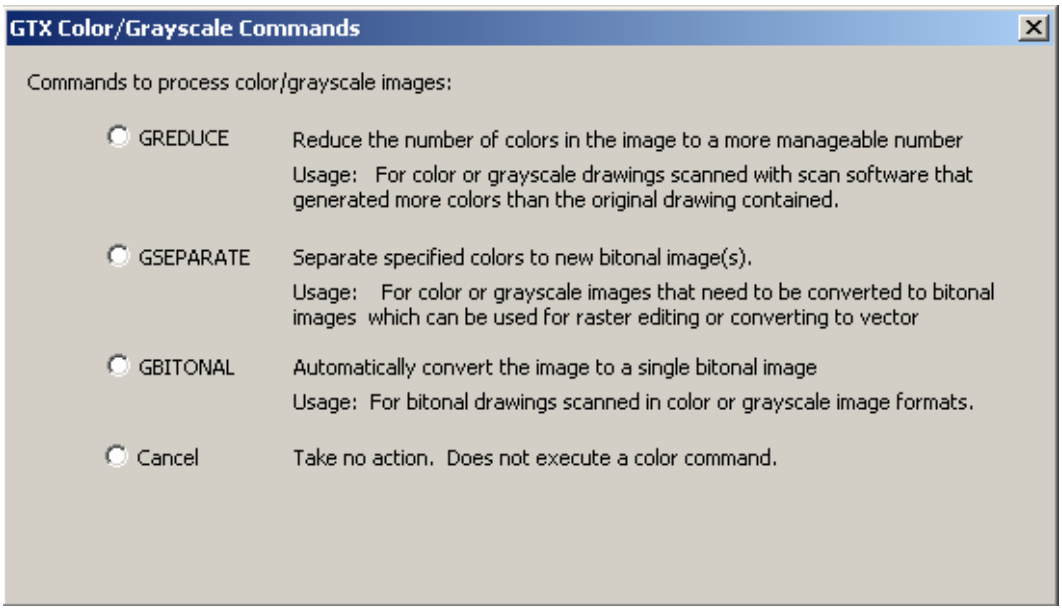
The image is attached at 0,0 and at the orientation specified by the AUTOROTATE configuration parameter.

Raster Resolution

If the GTXRAST.CFG setting is "FILE" the file's resolution will be used, but if a specific resolution is set in GTXRAST.CFG, it will override that of the file.

Color Images

There is a difference in the way the gATTACH handles & opens color or black & white (binary) images. If you use the gATTACH command to open a 'color image' you will additionally be asked how you wish to pre-process the color image


GTX Color/Grayscale Commands
Commands to process color/grayscale images:
GREDUCE
Reduce the number of colors in the image to a more manageable number
Usage: For color or grayscale drawings scanned with scan software that generated more colors than the original drawing contained.
GSEPARATE
Separate specified colors to new bitonal image(s).
Usage: For color or grayscale images that need to be converted to bitonal images which can be used for raster editing or converting to vector
GBITONAL
Automatically convert the image to a single bitonal image
Usage: For bitonal drawings scanned in color or grayscale image formats.
Cancel
Take no action. Does not execute a color command.

The best command to use depends mainly upon the number of colors that your image has.

gBITONAL

If you wish to automatically reduce a color image down to a simple binary image you can use gBITONAL The gBITONAL command has been optimized to operate on a broad range of color images & works well where an image has a clear-cut distinction between dark & light data.

However, the gBITONAL threshold may not give the exact results that you desire (by including or omitting important data from the binary image). In these instances it may be better to use the gREDUCE & gSEPARATE commands, where you have greater control of the color separation & threshold.

gREDUCE

If you have an image with greater than 256 colors you can firstly use gREDUCE to bring the image down to 256 colors or less.

For images with colors less that 256 colors, either before or after using reduction, you can use the gSEPARATE command. This allows you to accurately select colors, or groups of colors, & break then out into separate binary color images.

These separate binary images can, if required, be further processed using the full range of GTX capabilities & commands detailed elsewhere in this help file.

For more detailed information about each command's operation refer to the respective gBITONAL, gREDUCE & gSEPARATE section in the 'Command Reference'.

Cancel

Cancel does no pre-processing & just loads the image into AutoCAD. In this state you cannot work on the color image using GTX commands.

.

gAUTOSNAP

Type	Availability	Menu
GAS, GASP, GASNAP or GAUTOSNAP	GTXRaster CAD GTXRaster CAD PLUS	GTX Edit>Raster AutoSnap
	GTXRaster R2V	GTX Enhance>Raster AutoSnap

Icon:

gAUTOSNAP enables AutoCAD's AutoSnap™ options within an active image.

Details:

See "Snapping to Raster" in the Using GTXRaster CAD Series section for more details on using AutoCAD's AutoSnap™ within raster images.

Instructions:

`GAUTOSNAP: <0>,1:`

1. Type **1** to raster-enable AutoSnap™.

2. Invoke AutoCAD's **OSNAP** command. The dialog includes a Select Settings section.

3. Select the snap modes you wish to enable. The AutoCAD Endpoint, Intersection, Intersection and Node settings activate GTX raster snaps. Because AutoCAD does not provide "Edge" snapping, its Node snap is used to activate running edge raster snap.

AutoCAD Object Snap	GTX Raster Snap
Endpoint	Endpoint
Intersection	Intersection
Nearest	Nearest
Node	Edge

Select **OK**.

The aperture box will appear around the crosshairs and the marker will snap to raster features.

Note: ***AutoSnap™ uses glyphs (symbols) to represent the snap type. GTX running snaps use ToolTip labels to identify the snap being used. Snaps work instantaneously even though the ToolTips appear after a short delay.***

gBITONAL

Type	Menu	Availability
gBITONAL, gBIT	GTX Convert> Convert Image to Bitonal	All Products

Icon:

gBITONAL automatically reduces a color image to a binary (1-bit) image.

The gBITONAL command only works when you have one or more color (or greyscale) images loaded.

Instructions:

Issue the gBITONAL command. The program will then automatically reduce a multi-color image to a binary image.

If you have no color/greyscale images loaded & you activate the command you will get an error telling you that you don't have a suitable image for gBITONAL to work on.

If you have more than one color/greyscale image loaded you will be offered a dialog box to select the image you wish make bitonal.

Notes:
gBITONAL only works if you have a color (or greyscale) image loaded.

On large color images the gBITONAL command can take some time to process.

The gBITONAL algorithm has been optimized to operate on a broad range of color images. As such the command works well where an image has a clear-cut distinction between dark & light data.

However, the gBITONAL threshold may not give the exact results that you desire (by including or omitting important data from the binary image). In these instances it may be better to use the gSEPARATE command, where you have greater control of the color separation & threshold.

gBURN

Type	Menu	Availability
GBU or GBURN	GTX Convert>Burn All to Raster	GTXRaster CAD GTXRaster R2V GTXRaster CAD PLUS

Icon:

gBURN converts all vector entities into raster data with a designated line width.

Note: ***The raster database must be established before gBURN can be used. The database can be established either by loading a raster file or by using gCREATE. If the database has not been established, you will see a message and gCREATE will be invoked automatically.***
Only entities within the raster limits can be rasterized! Those outside the limits will be ignored or erased. When entities are partially outside, the part inside is rasterized; the part outside is erased.
All vector entities will be deleted when you use this command!

Options:

Width Options

Table Use the width settings according to color as set in the Width Table

Fixed Type in a value or select the width graphically using **Box** or **Pick**.

Instructions:

Dialog

1. Invoke **gBURN**. The following dialog will appear.

2. To specify line width you can a) enter a **Fixed** line width, b) specify it graphically by drawing a **Box** or by using **Pick** to select raster in the

drawing of the desired width, or c) use a **Table** to correlate the colors of vectors to raster line widths.

Fixed Line Width:

a. Select the **Fixed** radio button. Type the raster width to be used (in AutoCAD units, not pixels), or use the Pick or Box option to graphically specify the width.

Using Box:

a. Select the **Box** button.

```
Select first corner of box:
```

b. Select a point.

```
Select opposite corner of box:
```

c. As you move the cursor, a rubber-banding rectangle appears with one corner at the point selected. Move the cursor until the box is the desired width and the length exceeds the width. Select the point.

The best way to use this feature is to pick a point on the edge of an existing horizontal or vertical raster line and stretch the box along the line. You can then easily match the width. The length of the rectangle can be any size that is longer than the width as the smallest side is used as the width measurement. A reference rectangle is used instead of a square to make it easier to see. As soon as the second point has been selected, the rasterization takes place.

Using Pick

a. Select Pick.

```
Select raster <WIDTH>d
```

b. Select a piece of raster data of the desired raster width. The width of the selected raster will be entered in the “Fixed” text box.

Using the LineWidth Configuration Table:

a. Select the **Table** radio button and the **Table Setup** button. The LineWidth Configuration Table appears, correlating AutoCAD color numbers and line widths expressed in current units.

b. To change the width associated with a particular AutoCAD color, select that ACAD Color row. Enter the value in the **Width** text field. Select **OK** to close the dialog or select another row to change its width.

Line Width Configuration Dialog

```
Enter width <.XX>:
```

c. Enter the value for the width in the units being used and press **[RETURN]**. The Width Table will reflect the changes.

d. Select another color number to change its width or press [0] and **[RETURN]** to continue the command.

The entities will be changed to raster with the widths defined by their colors.

The highlighted entities will be converted to raster. Some residual vector markings overlay the raster until you redraw the image.

AutoCAD Prompts

1. Invoke **gBURN**.

```
Raster width Box/Pick/<Table>/.01:
```

2. There are three ways to respond to this prompt. You can 1) type in a value as the width to be used for all vector lines to be rasterized for plotting; 2) use the LineWidth Configuration Table to correlate AutoCAD color numbers with line widths; or 3) use the Box or Pick options to specify a standard linewidth graphically (as described above).

Fixed Line Width:

a. You can type in a value (in mm or inch) as the width to be used for all the vector lines to be rasterized. The value in parentheses is the default value or one previously used. If you enter a value it will remain the default line width during this editing session.

Note: ***If you defined the width previously in this session with a typed value or the "box" option, that value will appear as the default. You can press [RETURN] to accept this value or enter a number to represent the new width. The selected entities will all be converted to raster with the designated width.***

Using the LineWidth Configuration Table:

a. If you type in “T” or “Table”, the LineWidth Configuration Table appears. The listing correlates AutoCAD color numbers and line widths expressed in current units.

b. If you defined the width previously in this session with a typed value or the “box” option, that value will appear as the default. You can press **[RETURN]** to accept this value or enter a number to represent the new width. The selected entities will all be converted to raster of the designated width.

Note: ***The original default option is to use the Width Table set up by colors. This allows you to set different widths for entities being rasterized according to their color. If you press [RETURN] or [T], the Width Table will be displayed. The widths will be in inches or millimeters according to the unit set in GTXRAST.CFG.***

```
LINEWIDTH CONFIGURATION TABLE

To change a line-width for different AutoCAD colors, enter the
number for the entry. When you are satisfied with the settings,
enter 0 to continue.

AutoCAD Color #s      Width in Inches
0.      To Continue
1.      Color 1 (Red)          .01
2.      Color 2 (Yellow)       .01
3.      Color 3 (Green)        .02
4.      Color 4 (Cyan)         .02
5.      Color 5 (Blue)         .03
6.      Color 6 (Magenta)      .03
7.      Color 7 (White)        .04
8.      Color 8                .08
9.      Color 21               .09
10.     Color 23               .10
11.     Color 30               .11
12.     Color 41               .12
13.     Color 63               .13
14.     Color 153              .14
15.     Color 191              .15
16.     Color 161              .16
Enter the color number (1-16) of the width to change<0>:
```

c. Enter the number and press **[RETURN]**

```
Enter width <.XX>:
```

d. Enter the value for the width in the units being used and press **[RETURN]**. The Width Table will reflect the changes.

e. Select another color number to change its width or press [0] and **[RETURN]** to continue the command.

Note: ***The width settings you change will remain in effect until you change them or you exit AutoCAD.***

The vectors will be burned to raster with the table's widths.

Note: ***Polylines and other non-filled entities that have a width attribute will be drawn with the AutoCAD width attribute.***
Rasterization of certain entities may take a while to process.
Rasterizing text and ellipses takes longer than lines, for instance.
Select less data at a time to improve rasterization speeds.
You may need to zoom in to see line styles.
This command does not work for 3-D entities.

gCALIKE

Type	Menu	Availability
GCA or GCALIKE	GTX VClean>Calike	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gCALIKE modifies the radius of circles or arcs to a specified radius or to match that of a selected circle or arc.

Options:

The circles can be changed in terms of a Reference circle or arc, a specified Radius or Diameter.

Instructions:

```
Select objects:
```

1. Select one or more circles and/or arcs that you will want to set to identical radii.

```
Select reference circle or arc:
```

2. Choose a circle or arc with the desired radius.

```
Enter Diameter <Radius> <#.##>:
```

3. The reference object's radius will appear in the angle brackets. A rubber banding line stretches from the center of the reference object to the cursor. Press [RETURN] to accept the value, graphically select with the left mouse button the desired radius, type a new desired radius value, or type D and then enter a new diameter.

gCELEV

Type	Menu	Availability
GCE or GCELEV	GTX VClean>Contour Elevation	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gCELEV sets the elevation of a series of PLINE objects in increments.

Instructions:

Set the base or starting elevation.

Set the Contour Interval – the increments by which elevation is changed.

Press **OK**.

Stop/<Pick Contour>:

Select the polyline to assign the starting elevation.

Stop/<Pick Contour>:

Select the polyline to assign consequent elevations.

When done, type **S**.

gCHANGE

Type	Menu	Availability
GCH or GCHANGE	GTX Edit>Change	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gCHANGE stretches raster lines, arcs and circles. Change the radius of an arc by moving its circumference and endpoint. Change the radius of a circle by moving its circumference. Change the length and orientation of a line by moving one endpoint.

This command also merges or smoothes fragmented and irregular lines or arcs. To smooth, choose the raster entity and redraw it without changing its geometry. To smooth or merge entire sections of a drawing, use the gSMOOTH command. In the following illustrations, dashed lines portray rubber-banding lines.

Options:

Object Type Options

Line Select a line to be changed.

Arc Select an arc to be changed.

Circle Select a circle to be changed.

Instructions:

1. Select **gCHANGE**.

```
Select raster <LINE>:
```

2. The original default is “line”. If you want to select another type of object, select it from the menu or type the first letter of the name.

Using Line

a. Select a point on the raster line to serve as the endpoint that will NOT change. Then select a point to indicate the rest of the line that will be altered. The raster line will be highlighted and a rubber-banding reference line will appear, attached at the first point used to pick the line (If the first point was outside the raster line, the endpoint closest to that point is selected).

```
Select new endpoint:
```

Note: ***If you choose points to change a raster line drawn in a broken or dashed line style, all the segments will be selected, but the new line will be redrawn as a smoothed, solid line.***
Turn on the Ortho Mode ON if you want to change lines so they are perfectly horizontal or vertical or so they snap to a specified angle.

b. Move the cursor. The reference line will rubber band as it follows the cursor. Press **[SELECT]** to select the new point where the line should end. The reference line will disappear and the raster line will be redrawn at the new orientation and length.

Using Arc

a. Select the endpoint that will NOT change. Then select a point on the circumference of the arc and the other endpoint of the arc. These three points define the raster arc and the selected arc will be highlighted.

```
Select new circumference point:
```

b. You will see a rubber-banding line extending from the first endpoint selected. Select a point to be on the circumference of the new arc.

```
Select new endpoint:
```

c. The rubber-banding line will be attached at the second point. Select the endpoint for the new arc in any of the usual ways. The raster arc will be redrawn through the three points. If the original arc was in several pieces, they will be selected but the new arc will be solid.

Using Circle

a. Select the “circle” option from the menu.

```
Select point on circumference of circle:
```

b. Specify the raster circle by selecting three points on the circumference. After the raster circle has been selected, it will be highlighted. A rubber-banding line from the center of the circle will appear.

```
Enter circle radius:
```

c. Enter a value in current units or select a point to indicate the radius of the new circle. The circle will be redrawn with the original center point and the new radius.

Note: ***If the original circle was broken into arcs or drawn in a dashed line style, they will be selected but the new circle will be unbroken.***

gCHGLAY

Type	Menu	Availability
GCHGLAY GCHL	GTX VClean>Change Layer	GTXRaster CAD PLUS GTXRaster R2V

Icon:

gCHGLAY changes the layer of objects to that of a specified object.

Instructions:

```
Select Objects to Change Layer:
```

1. Select the objects you want to move to a destination layer.

```
Dialog/<Select object on NEW layer>:
```

2. Either type **D** to select a layer or to define a new layer, or select a sample object that is already residing on the desired destination layer.

If you selected a sample object, the selected objects are moved to the same layer as the sample. If you selected dialog, continue reading the following instructions:

The Manual Layer Selection dialog appears.

3. Select the destination layer name from the list or select **New Layer** to define a new destination layer for the selected objects.

4. When done, select **OK**.

The selected objects are moved to the specified layer.

gCIRCLE

Type	Menu	Availability
GCIRCLE GC	GTXEdit>Draw Circle	ALL Products

Icon:

Draws a raster circle in the current raster image

Instructions:

gCIRCLE

Center Point:

Select (or type) the centerpoint of the circle.

Radius [Diameter]:

Select (or type) the radius, or type "**D**" and then specify the Diameter.

The circle appears after the radius or diameter is specified.

Note: If there is no active image, gACTIVE will be invoked before continuing with gCIRCLE. If there is no image attached gCREATE will be invoked to set up an image into which raster line can be drawn.

gCLEANIOP

Type	Menu	Availability
GCLEANIOP	GTXEnhance>Clean IOP	GTXRaster CAD, R2V & GTXRaster CAD PLUS

Icon:

gCLEANIOP deskews the image and removes noise and speckles. gCLEANIOP creates a selection set of all noise. You can use ADD and REMOVE in combination with other IOP methods to refine the selection set. When finished, the command deletes the highlighted raster.

Instructions:

The image automatically deskews and noise is highlighted.

```
Select Raster <WINDOW>:
```

Add or remove raster using standard IOP methods. When done adding and removing raster, press [RETURN].

gCONCEN

Type	Menu	Availability
gCONCEN or GCONC	GTX VClean>Concen	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gCONCEN moves circles and arcs to be concentric about a location or about the centerpoint of a specified circle or arc.

Instructions:

```
Select Objects:
```

1. Select one or more circles or arcs

```
Pick point/<Select circle/arc>:
```

2. Select another arc or circle about which the previously selected objects should become concentric. Alternatively, type **P** and select the location itself.

The selected objects are moved so their centerpoints align about the centerpoint of the target object or about the indicated location.

gCONVRT

Type	Menu	Availability
GCO or GCONVRT	GTX Convert>Vectorize	GTXRaster CAD PLUS GTXRaster R2V

Icon:

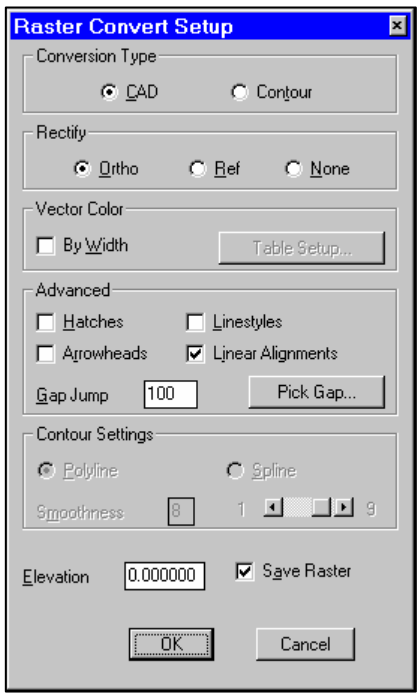
gCONVRT converts raster data to AutoCAD vector geometry.

Instructions:

Conversion Type

CAD conversion, raster data is converted into lines, arcs, circles and “arrowheads” (triangular SOLID entities). This option is best for mechanical drawings and line diagrams.

Contour causes raster data to be converted into polyline or spline entities. This option is best for maps and other documents containing contours.



Rectify

Ortho Improve the drawing by making cleaner intersections; snapping lines to horizontal or vertical. Where applicable, fillet arcs are snapped to increments of 90 degrees, producing a high quality filleted corner.

Reference snaps lines that are close to a specified reference angle to that angle. Parallel lines at this angle separated by a distance close to the offset distance are snapped to that distance.

1. Select **Reference**.

```
First point for snap angle:
```

2. Select the first point for the angular line.

```
Second point for snap angle:
```

3. Select the second point to define the angle.

```
Reference angle <XX.XXXXX>:
```

4. You can type in a new value for the angle or press **[RETURN]** if it is satisfactory. You cannot redefine it by selecting points.

```
Parallel alignment offset <0.0>:
```

5. This value determines the distance between the imaginary grid lines parallel to the given reference angle. Type in a value in current drawing units. Using the **(0.0)** value which is always the default means no grid snapping for this angle.

```
First point for snap angle:
```

6. You can define another reference angle and grid or press **[RETURN]** if you don't want to use another one. When you are finished defining the angles, press **[RETURN]**. The command then continues as above.

Note: ***If you use the Reference Angle option, orthogonal rectification will not occur automatically. However, you can enter "0" and "90" reference angles to achieve orthogonal rectification.***

None converts raster exactly as it appears without any rectification.

Vector Color

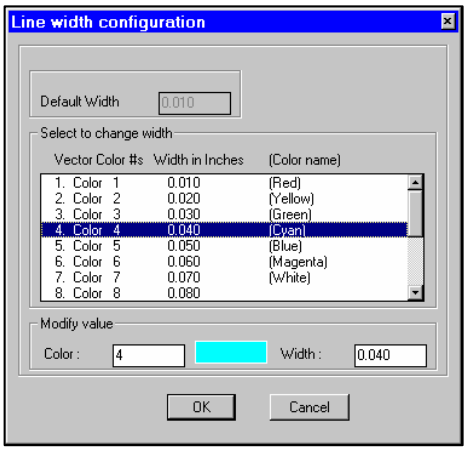
AutoCAD vector entities don't have any width. You can preserve information stored in the line width of the raster image; you can assign a color to vectors resulting from different line widths.

By Width causes the values in the line-width configuration table will be used to determine the color of the vector entities. **Table Setup** displays the table and values can be changed if desired. If several colors are given the same width value, only the lowest number color will be used for that line width.

1. Select the **No Widths** check box to render resulting vectors in the current AutoCAD layer's color or select the **Table Setup** button to color-code resulting vectors for up to 16 different line widths.

Line Width Configuration Table Dialog

2. Click on the color to modify a color's width value. Enter the new value in the **Width** input window at the lower right corner.



Note: ***If you set your AutoCAD display options so that the background of the screen is white, the Line Width Configuration Table's "white" color (color #7) will refer to <u>black</u> vectors.***

3. Select another color to change or click **OK** to exit the Line Width Configuration dialog.

Leaving **By Width** inactive causes resulting vectors to inherit the color and linestyle of their layers.

Hatches

When this is active, vectors generated from hatched areas will be isolated on their own AutoCAD layer. The name for this layer is established by the Hatch_Layer_Name configuration parameter in *GTXRAST.CFG*. You can create this layer in advance in your drawing template and give it a color if you always want hatched data to appear the same.

```
Hatch angle? <0.000>/Pick:
```

1. Type the hatch angle or type **P** to select two points designating the angle.

```
Parallel alignment offset <0,0>
```

2. Type the distance between hatches or select two points designating the distance.

```
Hatch angle? <45.000>/Pick:
```

When done, press **[RETURN]**.

```
Parallel alignment offset <0,0>
```

Press **[RETURN]** again.

Linestyles

When this is active, lines that appear to have regular breaks in the raster image will be isolated on their own AutoCAD layer. The name for this layer is established by the Linestyle_Layer_Name configuration parameter in *GTXRAST.CFG*. As with Hatch_Layer_Name, you can create this layer in advance in your drawing template and give it a color and linestyle if you always want hatched data to appear the same.

Arrowheads

Controls whether arrowheads (3-sided solids) are generated during CAD type conversion.

Linear alignment

Linear Alignment causes broken lines to be merged into unbroken lines as they are vectorized. This is used to convert dashed geometry as a single entity (then the entities can be moved to a dashed AutoCAD layer). If this box is empty, collinear geometry with gaps or breaks will be vectorized without closing the gaps. The gap is established by the **Gap Jump** setting.

Gap Jump

Sets the distance in pixels for **Linear Alignment** to jump when combining multiple collinear lines into single lines (as in recognizing dashed linestyles). This can be set by manually entering the distance or by selecting **Pick Gap** and then graphically showing a gap distance.

Other Options

Save Raster preserves raster data after converting it to vector. If this box is empty, the raster will be erased after conversion.

Elevation sets the elevation at which resulting vectors will be created. The default value is 0. To create contours at different elevation, set this value before converting raster to vector.

Elevation

Set the **Elevation** to the level at which resulting vectors should be created (normally you want this to be 0).

When all parameters are set as desired, click **OK** to launch the conversion process.

Prompt Mode

gCONVRT also works exclusively with AutoCAD prompts when the CMDDIA variable is set to 0.

gCOPY

Type	Menu	Availability
GCP or GCOPY	GTX Edit>Copy	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gCOPY copies raster data from one location to another location in the image entity.

Options:

Movement Options

Base Point Indicate the offset distance for the copy by selecting two points.

Note: Turn the ORTHO Mode ON to place copies in a perfectly horizontal, vertical, or specified direction from the last position.

Displacement Enter X and Y offset values to indicate copy placements.

Instructions:

1. Select **gCOPY**.

```
Select raster <WINDOW>:
```

2. Select the raster to be copied. The selected raster will be highlighted.

3. When all of the raster to be copied is highlighted, press **[RETURN]**.

```
Base point or displacement:
```

There are several ways to respond to this prompt. To use the default option, either select a reference point or type in how far over the selected data should be copied. Since the system does not know whether X,Y value typed in this is the base point or the displacement distance, the response to the second point clarifies this.

Using Base Point

a. Select a base point either by using the cursor or by typing the coordinates. This will be a reference point for the copy process.

```
Second point of displacement:
```

b. A rubber-banding line will appear attached at the base point. Select a second point to define the relative distance and angle for placement of the copy. The copy will appear in the designated location in the display raster color. The original raster will be un-highlighted. The command will terminate.

Using Displacement

a. At the “base point or displacement” prompt, type in the X and Y value for the displacement in the same format used to enter coordinates. You will see the same prompt as above.

```
Second point of displacement:
```

b. Press **[RETURN]** to indicate that the original entry was the displacement. The raster data you selected will be copied to its new location in the main raster color. The original raster will be un-highlighted. The command will terminate.

Copy All Images

Type	Menu	Availability
gCAI	GTX Imaging>Modify Images>Copy All Images	GTXRaster Tools GTXRaster CAD GTXRaster CAD PLUS GTXRaster R2V

Icon:

Copy All Images invokes AutoCAD COPY command on all image entities.

gCREATE

Type	Menu	Availability
GCR or GCREATE	GTX Imaging>Create	All Products

Icon:

gCREATE establishes an unnamed raster image entity on the current AutoCAD layer. The raster data can be modified within the limits, which can be changed later using the gRESIZE command.

The MaxNumPixels configuration parameter limits the number of pixels allowed in a new raster image. The default value is:

```
MaxNumPixels=973440000
```

which at 400 dpi could generate an image measuring 78” x 78”.

Instructions:

1. Select **gCREATE**.

```
Enter raster resolution DPI <200>:
```

2. Enter a positive **integer**.

```
select lower left corner of raster limits <0.000,0.000>:
```

3. Normally, you enter “0,0” for this value. However, you can select any point either by typing coordinates or selecting it graphically.

```
Select upper right corner of raster limits:
```

4. A rubber-banding box will appear attached at the first point. Select the point for the upper right corner either with coordinates or graphically.

Warning: ***When creating a new raster image in a hybrid environment, consider the drawing’s scale. Raster images will normally be about the same size as paper media. Create images at “paper” size and then scale them against your vector data. You don’t want to create a raster image the size of a house or a map - it will take a long time if it works at all!***

5. The program will check whether there is sufficient memory for the work area you designate. If not, you will get an error message.

gCROP

Type	Menu	Availability
GCRO or GCROP	GTX Enhance>Crop	All Products

Icon:

gCROP Deletes all raster data outside of a specified rectangular window. For instance, you may use it to get rid of “dirty” edges or an unwanted frame.

Instructions:

1. Select the gCROP command.

```
Select first corner of window:
```

2. Select a point for one corner of the window.

```
Select opposite corner of window:
```

3. A rectangular window will rubber-band from the first point selected. Position it to include all the raster data you want to save. Press **[SELECT]** to select the point.

Note: ***If your drawing is skewed or rotated, use gDESKEW first. To reduce the raster limits by eliminating the outside area, use gRESIZE or use the gCUT command to create a new file.***

The raster data outside the window will disappear. The raster limits stay the same.

gCUT

Type	Menu	Availability
GCU or GCUT	GTX Edit>Cut	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gCUT copies raster data from the active image entity to a raster file or to memory. The default filename is set in the configuration file.

Note: ***1. Raster data cut from images is oriented relative to the raster file's coordinate system. When cutting raster data from a rotated image entity, the raster is not necessarily saved as displayed within AutoCAD. Also, when pasting raster data into a rotated image, the raster data appears at the image entity's native rotation.***
2. If the "raster limits" box does not enclose all of the highlighted raster data, the data outside the rectangle will not be saved in the file.
3. If the rectangle does not fall entirely within the raster limits, the limits will be used instead of the point(s) selected.
If you want to save the file with a format other than the one specified in the GTXRAST.CFG file, type in the extension that defines that format.

Options:

Mode Options

Copy Copy the data and retain it on the screen.

Erase Copy the data and erase it from the drawing.

Destination Options

File Copy the data to a raster file.

Buffer Copy the data to a temporary buffer (to be gPASTE-d later).

Instructions:

1. Select gCUT.

```
Command: gCUT
Mode <Copy>/Erase:
```

2. The default value is in brackets. Press **[RETURN]** to select the default or select the desired mode from the menu or by entering its abbreviation.

```
Select raster <WINDOW>:
```

3. Select the raster data.

4. Press **[RETURN]** when all the raster data to be saved in the new file has been highlighted. You will next be prompted to define the image limits.

```
Select lower left corner of raster limits:
```

5. Type in the coordinates for the point or position the cursor and press **[SELECT]**. A rubber-banding box will appear attached at the point.

```
Select upper right corner of raster limits:
```

6. Select the point for the upper right corner of the limits. The two points you have selected are stored as the upper and lower limits of the image.

```
File/<Buffer>:
```

7. Enter **B** to copy the data to a temporary raster buffer. The selected data within the rectangle will be copied to a raster buffer for later insertion using **gPASTE**. Enter **F** to save the selected data to a raster file (Continue with step 8).

Dialogs:

a. After specifying **F** or **File**, **gCUT** will save the selected data to a raster file. **gCUT** will display the **SAVE Raster File** dialog.

Enter the desired file name and select the appropriate path for the new file.

b. To change the default file type, select the scroll box labelled “List Files of Type:” and select the desired file format.

c. The file name entered does not need to include the extension. The file type extension displayed in the **List Files of Type:** box will be used.

d. Click **OK** to return to the drawing editor.

Prompts:

a. After specifying **F** or **File**, **gCUT** will save the selected data to a raster file. **gCUT** will display the following prompts:

```
Enter raster file name <cut_data.ext>:
```

b. The default file name is “cut_data” with the extension indicated in the *GTXRAST.CFG* file. If you have previously used **gCUT**, the name of that file will be the default shown in brackets. Accept the default file name by pressing **[RETURN]** or type a new name for the raster file and press **[RETURN]**.

If you do not include the extension, the format and extension set in the *GTXRAST.CFG* by “RasterFormat” and “RasterSaveExt” entries will be used. If no path is indicated, the file is saved using the path defined in the *GTXRAST.CFG* “RasterPath” entry. If no path was defined, it is saved in the current directory.

c. If a file already exists with the same name you typed as a new name, you will be asked whether to replace it. If you respond “yes”, the new file will overwrite the old one. If you accept the default, “No”, you will again be prompted for a raster file name. The request is repeated until an acceptable name is entered or you cancel the command without saving a file.

d. When a file has been saved, the highlighting will disappear. If the “erase” mode was selected, the highlighted data will also disappear. Otherwise the raster data remains as it was before the command was invoked.

```
Raster file FILENAME.EXT saved.
```

gDESKEW

Type	Menu	Availability
GD or GDESKEW	GTX Enhance>Deskew	All Products

Icon:

Drawings are often scanned in slightly rotated. gDESKEW straightens selected raster by rotating it to align with the X or Y axis.

The gADESKEW (Auto Deskew) command may be faster and easier with drawings that have titleblocks.

The deskew uses reference line that is rotated to horizontal or vertical (whichever is closer). Pick points as far apart as possible. Use transparent zoom or raster snapping features to draw the reference line precisely.

The lower left corner is used as the rotation point.

Processing time depends on image size, and resolution, and available memory.

Instructions:

1. Select gDESKEW.

```
Command: gDESKEW
This command could fail in limited memory situations
Do you want to save the raster image first? Yes/<No>:
```

2. If you have adequate memory for the file you are using or have already saved the data, press **[RETURN]**. Otherwise, it is a good idea to respond “Yes”. GTXRaster CAD will then invoke **gSAVE**, you will save the data and **gDESKEW** will continue.

```
Select raster <WINDOW>:
```

3. Select the raster data to deskew. If deskewing the entire drawing, type: **ALL**. Press **[RETURN]**.

```
Select one end of reference line:
```

4. Select a point on a raster line that should be perfectly horizontal or vertical. A rubber-banding reference line will extend from it to the cursor.

```
Select other end of reference line:
```

5. Move the cursor to the second point on the line and select it. The deskew will take place, based on the reference line you indicated. You will see a message: De-skewing XX.XXXXXX degrees.

```
Do you wish to displace deskewed raster? Y/<N>:
```

6. If the raster is located correctly, press **[RETURN]**. The command will be completed. If you wish to move the deskewed raster, type: **Y**.

```
Base point or displacement:
```

There are two ways to respond. You can either select the first of two points that will show the movement graphically or type in the offset values in the form X,Y. Since the system does not know whether the X,Y value typed in is the base point or the displacement distance, the response to the second prompt clarifies this.

Using Base Point

1. Select the reference point for the moving process.

```
Second point of displacement:
```

Note: ***1. If you skew the same file several times the raster data could become distorted. If this happens, re-load the raster image and deskew it again using gDESKEW once.***
2. If the image needs to be rotated more than 5 degrees you should re-scan the drawing. Deskewing the entire image more than a few degrees can distort the raster data.
3. Large files may take several minutes to complete the operation. Using transparent zoom or the "end" or "int" raster snapping methods can help you more accurately pick your reference line.

2. A rubber-banding line will appear attached at the base point. Select a second point to define the relative distance and angle for the new placement of the deskewed raster. It will appear in the designated location. The command will be completed.

Using Displacement

1. Type in the X and Y values for the displacement in the same format used to enter coordinates. You will see the same prompt as above.

```
Second point of displacement:
```

2. Press **[RETURN]** in response to the prompt to indicate that the original entry was the displacement. The deskewed raster will appear in the new location.

DrawOrder Back

Type	Menu	Availability
GDRO_BK	GTX Imaging>Modify>Send Images to Back	All Products

Icon:

DrawOrder Back Moves all raster image entities' draworder to back using AutoCAD's DrawOrder command.

gECONVRT

Type	Menu	Availability
GEC or GECONVRT	GTX Convert>Vectorize Edge	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gECONVRT converts raster data to AutoCAD vector geometry.

Options:

ContourWhen checked, raster contours are converted into polyline entities, which are good for designating contours. When this checkbox is empty, raster data is converted into lines, arcs, and circles.

Save Raster Retains raster after conversion to vector. If this box is empty, the raster is erased during conversion.

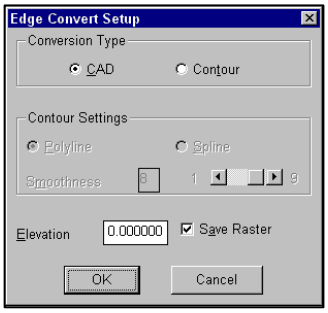
Elevation Sets the elevation at which resulting vectors will be created. The default value is 0. To create contours at different elevation, set this value before converting raster to vector.

Instructions:

1. Invoke gECONVRT.

```
Specify raster <WINDOW>:
```

2. Select the desired raster and press **[RETURN]**. The **Edge Convert Setup** dialog will appear:



Width Recognition

The edge of a solid raster area has no width, so this option is disabled. Proceed to the conversion type.

CAD or Contour Conversion:

3. Checking the **Contour** box will cause lines and polylines to be generated. Leaving this box un-checked will cause only lines, arcs and circles to be generated.

a. If the **Contour** option is checked, the **Polyline Smooth Index** input window will contain a value between **1** and **9**. A value of 1 would follow the contours least smoothly, and 9 results in the closest match to the contour.

With lower resolution images you may want to choose values lower than 8 or 9 so that the polylines don't follow the square contours of individual pixels!

4. Set the **Elevation** to the desired level at which resulting vectors will be created.

5. Set **Save Raster** to your preference

6. Select **OK** to start the conversion.

gEDGE

Type	Menu	Availability
GED or GEDGE	GTX Enhance>Edge	All Products

Icon:

gEDGE removes the inside of solid raster regions, leaving only the edge. Removes all raster except a single pixel width contour around the edge of selected raster data.

Instructions:

Command Dialog:

1. Invoke gEDGE.

```
Select raster <WINDOW>:
```

2. Select the raster you wish to “hollow out”. Press **[RETURN]**.

3. The insides of the raster are erased, leaving a 1-pixel edge around the outside.

gERASE

Type	Menu	Availability
GE or GERASE	GTX Edit>Erase	All Products

Icon:

gERASE removes selected raster data from the drawing.

Instructions:

1. Invoke **gERASE**.

```
Select raster <WINDOW>:
```

2. Select the raster you want to remove.

3. When all the raster data to be removed is highlighted, press **[RETURN]**. The selected raster is then erased.

gFRZLAY

Type	Menu	Availability
GFR or GFRZLAY	GTX VClean>Freeze Layer	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gFRZLAY freezes the layer of a selected object.

Instructions:

`Dialog/<Select object>:`

Choose an object residing on the layer you wish to freeze or type **D** to use the dialog.

Object:

The layer of the selected object becomes frozen.

Dialog:

A dialog appears. Choose the layer or layers to freeze and select **OK**.

gHELP

Type	Menu	Availability
GH or GHELP	GTX Imaging>Help	All Products

Icon:

gHELP starts the GTXRaster CAD Help file. The Help window functions as any other Windows application Help file, including “search for keyword” capabilities.

The Help file can also be executed from the GTXRaster CAD Help icon in the GTX program folder.

For more information on available sources of help, refer to the Introduction.

Image Frame

Type	Menu	Availability
ImageFrame	GTX Imaging>Modify Images>Image Frame	All Products

Icon:

ImageFrame sets frames for all image entities to on or off. Sets the AutoCAD ImageFrame variable.

Image Transparency

Type	Menu	Availability
Transparency	GTX Imaging>Modify Images>Image Transparency On	All Products

Icon:

Transparency makes all images transparent when selected from the Imaging toolbar. Otherwise lets you set the transparency mode for selected images.

gINACTIVE

Type	Menu	Availability
GINA or GINACTIVE	GTX Imaging>Deactivate Image	All Products

Icon:

gINACTIVE deactivates the active image entity, freeing memory. In order to edit the image you must reinvoke gACTIVE and choose the image.

gINFO

Type	Menu	Availability
GI or GINFO	GTX Imaging>Info	All Products

Icon:

gINFO displays details about the current raster image and the software license. It includes the default values for raster file name and format, as well as the resolution, the raster limits and data extents (in current drawing units). The file name and format will be that of the last raster file loaded or saved.

Instructions:

1. Select **gINFO**. You will see a listing on the text screen display similar to the following. The values shown are sample values only.

Resolution: Shows the resolution of the current raster database in terms of dots per inch (DPI). This value is obtained from the resolution from the file unless overridden by the *GTXRAST.CFG* **Resolution** setting or by a resolution established using **gCREATE**.

Raster data limits: Defines the rectangular area indicating the size of the present raster image, including bounding white space, set with **gCREATE** or **gRESIZE** or by the limits of the raster drawing that was loaded. The values are given in current drawing units.

Raster data extents: Defines smallest rectangular area that can enclose the raster data in terms of AutoCAD units. It is defined by the X and Y coordinates of the lower left corner, followed by the X and Y coordinates of the upper right corner of the rectangle. The extents determine where raster data is currently drawn.

Drawing limits: Defines the AutoCAD drawing limits.

Source FileName: The name of the raster file to which the image refers.

Active FileName: The filename to which **gSAVE** will save.

Raster File type: This reflects the format of the last raster file saved with **gSAVE** or the setting in *GTXRAST.CFG* if no file has been saved yet.

Undo store size: Number of raster undo's being recorded.

Image modified? Flag identifying whether image has been changed since the last save (TRUE or FALSE).

Version: Shows GTX program, version number, and ARX version of the GTX program that is running.

gINVERT

Type	Menu	Availability
GIN or GINVERT	GTX Enhance>Invert	All Products

Icon:

gINVERT Reverses the background and main raster colors of the current raster image. Use it on files scanned in reverse (light on dark). This does not just invert the *display* of an image - it truly inverts the raster image itself.

Instructions:

The color of the background and the color of the data will be switched. You can then edit the raster data with any of the GTXRaster CAD commands.

Undo gINVERT by invoking the command again.

gISOLAY

Type	Menu	Availability
GISL or GISOLAY	GTX VClean>Isolate Layer	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gISOLAY freezes all layers except that of the selected object, effectively isolating its layer.

Instructions:

```
Select objects:
```

Select objects on the layer or layers you want to isolate.

Press **[RETURN]**.

The layers of the objects chosen in step 1 are isolated by freezing all other layers.

gJOIN

Type	Menu	Availability
GJO or GJOIN	GTX VClean>Join	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gJOIN joins vector lines together.

Instructions:

Select line startpoint.

Select the endpoint of the line you wish to join with another line.

```
Select object
```

Select the first line (whose endpoint you selected).

```
Select object
```

Continue selecting lines until all lines you wish to join have been selected.

Press [RETURN]

All selected lines are merged into one line.

gLINE

Type	Menu	Availability
GLN or GLINE	GTX Edit>Draw Line	All Products

Icon:

gLINE draws a raster line in the current raster image.

Instructions:

`From point:`

Select or type the first endpoint.

`To point:`

Select or type the other endpoint.

The command continues, allowing you to continue entering point coordinates.

`To point:`

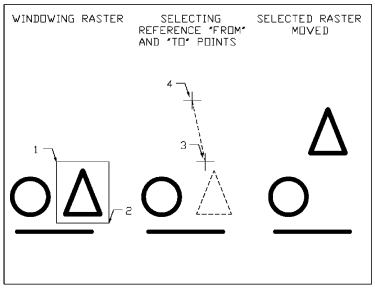
Note: ***If there is no active image,*** *gACTIVE* ***will be invoked before continuing with*** *gLINE****. If there is no image attached, gCREATE will be invoked to set up an image into which the raster line can be drawn.***

Enter the endpoint for the next line or press **[RETURN]** to end the command.

gMIRROR

Type	Menu	Availability
GMI or GMIRROR	GTX Edit>Mirror	GTXRaster CAD GTXRaster CAD PLUS

Icon:



gMIRROR creates a mirror image of selected raster data. This is different from reflect which mirrors the entire current raster image. You will define a line for the data to be mirrored across. You may either retain or discard the original data.

Instructions:

1. Select gMIRROR.

```
Select raster <WINDOW>:
```

2. Select the raster data to be mirrored. The selected raster will be highlighted.

3. When you have selected all the items to be mirrored, press **[RETURN]**.

```
First point of mirror line:
```

4. Select a point for the start of the reference line.

```
Second point:
```

5. Select another point to define the reference line.

```
Delete old objects? Yes/<No>
```

6. Press **[RETURN]** to preserve the original raster geometry. If you only want to keep the new mirrored data, enter **Y**.

gMOVE

Type	Menu	Availability
GM or GMOVE	GTX Edit>Move	GTXRaster CAD GTXRaster CAD PLUS

Icon:

Function:

gMOVE moves selected raster data from one area to another on the drawing. The displacement points define the relative distance and angle that the items will be moved from the original position.

Note: ***Turn ORTHO mode ON to move objects in perfectly horizontal or vertical directions.***

Options:

Base point Indicate the offset distance for the copy by selecting two points.

Displacement Enter X and Y offset values to indicate copy placement.

Instructions:

1. Invoke **gMOVE**.

```
Select raster <WINDOW>:
```

2. Select the raster data to be moved. The selected raster will be highlighted.

3. When you have selected all the items to be moved, press **[RETURN]**.

```
Base point or displacement:
```

There are two ways to respond. You can either select the first of two points that will show the movement graphically or type in the offset values in the form X,Y. Since the system does not know whether the X,Y value typed in is the base point or the displacement distance, the response to the second prompt clarifies this.

Using Base Point

a. Select a point either by using the cursor or by typing the coordinates. This will be a reference point for the moving process.

```
Base point or displacement:
Second point of displacement:
```

b. A rubber-banding line will appear attached at the base point. Select a second point to define the relative distance and angle for the new placement of the data. The data will appear in the designated location in the main raster color. The raster will disappear from the original location. The command will be terminated.

Using Displacement

a. Type in the X and Y values for the displacement in the same format used to enter coordinates. You will see the same prompt as above.

```
Second point of displacement:
```

Press **[RETURN]** in response to the prompt to indicate that the original entry was the displacement. The raster data you selected will disappear from the original location and be displayed in the new location in the raster color.

Move All Images

Type	Menu	Availability
gMAI	GTX Imaging>Modify Images>Move All Images	All Products

Icon:

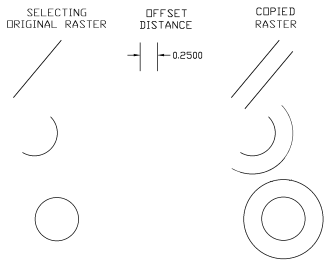
Move All Images invokes AutoCAD Move command on all image entities.

gOFFSET

Type	Menu	Availability
gOFFSET GOFF	GTX Edit>Offset	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gOFFSET creates a copy of a selected line, arc, or circle parallel or symmetrical to the original. This command is similar to the AutoCAD OFFSET command.



Instructions:

Having prepared an image for editing,

1. Invoke gOFFSET.

```
Offset distance or Through <Through>:
```

2. Either enter a distance or use the mouse to indicate the distance through which copies will be offset.

```
Select raster <LINE>:
```

3. At this point you enter “C” for circle, “A” for arc, or click two points on a raster line.

Line

Click two points along the raster line.

Arc/Circle

Click three points along the circumference of the arc or circle.

Offset

```
Side to offset?
```

4. Click a point to one side of the line, arc or circle. (You can click inside or outside a circle).

A copy of the original entity will be placed at the specified offset distance on the indicated side.

gOSR

Type	Menu	Availability
GOSR	GTX Convert>OSR Batch Convert	GTXRaster R2V GTXRaster CAD PLUS

Icon:

Function:

gOSR launches the GTX OSR batch vectorization program. This requires that you have a license for either GTXRaster CAD *PLUS* or GTXRaster R2V, as well as a license for GTX OSR.

Instructions:

1. Invoke **gOSR**. If the directory containing GTX OSR (*C:\GTX_OSR*) is on the system path, then it will run.

2. If the directory is not in the system path, a file dialog will be displayed.

3. Locate the GTX OSR executable and select **Open**. GTX OSR will run.

Refer to Appendix 4: GTX OSR V5.0, on page 248 for further details.

gPASTE

Type	Menu	Availability
GP or GPASTE	GTX Edit>Paste	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gPASTE inserts a saved raster image at a specified location on the graphics screen. You can use this command to insert saved raster onto an existing image or onto a blank graphics screen to create a new image. The image may be scaled or rotated as it is placed. The default values for file format and name will be taken from the *GTXRAST.CFG* file or the current database, but can be overridden. Raster files of any acceptable format can be used.

1: Raster data cut from images is oriented relative to the raster file's coordinate system. When cutting raster data from a rotated image entity, the raster is not necessarily saved as displayed within AutoCAD. Also, when pasting raster data into a rotated image, the raster data appears at the image entity's native rotation.

2: If there is no active image, *gACTIVE will be invoked before continuing with gPASTE. If there is no image attached, gCREATE will be invoked to set up an image into which raster data can be pasted.*

Options:

Source Options:

File Insert raster data from a raster file.

Buffer Insert raster data from a temporary buffer (previously created with gCUT).

Paste Options:

Move Move the pasted data to a different location.

Rotate Specify the desired orientation (angle) of the image.

Scale Specify the factors by which to change the X and Y dimensions.

Fit A “Scale” option that allows you to show the scale graphically.

Instructions:

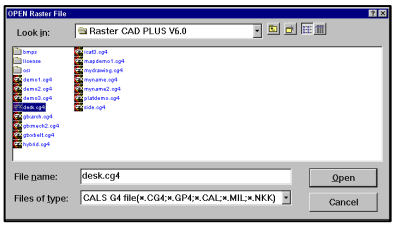
1. Invoke the gPASTE command.

```
File/<Buffer>:
```

2. Type **F** to paste data from a raster file. Type **B**, **Buffer** or **[RETURN]** if it is the default as shown above to paste data from a temporary buffer (created with **gCUT**).

Pasting from a File:

gPASTE will determine the raster file you wish to paste. If *CMDDIA* is set to **1**, the following dialog will appear:



Enter the desired file name and select the appropriate path for the new file.

If *CMDDIA* is set to **0**, **gPASTE** will issue the following prompt:

```
Command: GPASTE
Enter raster file name <cut_data.ext>:
```

Type the name of the raster file that you want to paste. “Cut_data” or the last file pasted is the default, shown in brackets. If no path is entered, the program looks for the file in the current directory, then for the ACAD path, then for the DOS path.

Pasting from a Buffer

gPASTE will paste raster data from a buffer only if you previously performed a **gCUT** to that buffer.

After determining the source of the raster data to be pasted, the following prompt will appear:

```
Insertion point <0.0000,0.0000>:
```

3. Select the point where the lower left corner of the file should be placed. The raster data of the file will appear at that location in the

main raster color. The **gPASTE** menu will replace the GTXRAST menu.

```
Loading raster -- filename.ext ...
Move/Rotate/Scale
```

4. If you are satisfied with the default settings and the present location of the raster, press **[RETURN]** to exit from the command. To change the location, rotation or scale, select the desired option. Options can be selected in any order and any number of times until you press **[RETURN]** to exit from the command.

The same data can be selected for further raster editing with the "previous" option of the editing command. For instance, if you want to have more than one copy of the pasted data at the same size and orientation, you can select **gCOPY** and "previous".

Using Move

1. Select "Move" by entering "m" or selecting "Move" from the menu. The pasted data will be highlighted. You will be prompted to indicate a base point for the move.

```
Base point or displacement:
```

2. Select a reference point. This may be a significant point such as the center of a cross.

```
Second point of displacement:
```

A rubber-band line will extend from the base point.

3. Select a second point to indicate the distance and angle that the base point should move. The raster data will move to the new location and be un-highlighted. The reference line disappears.

```
Move/Rotate/Scale:
```

4. You can continue to select options or press **[RETURN]** to terminate the command.

Using Rotate

1. Enter "r" or select "Rotate" from the menu to change the orientation of the reference box. The pasted data will be highlighted.

```
Base point:
```

2. Select a point for the center of rotation.

```
Rotation Angle <0.0>/Reference:
```

3. A rubber-band line will extend from the base point. The rotation point is the lower left corner of the box. The rotation is counter-clockwise from the X-axis if a positive angle is entered.

There are several ways to respond. You can accept the default angle by pressing **[RETURN]** or use either of the two options. The default angle, initially zero degrees, reflects the value used for a previous **gPASTE** operation.

Rotation Angle

Using rotation angle, you can specify the angle with reference to the X-axis by typing in a value (in degrees) or by rubber-banding the reference line.

When you designate the angle by either method, the raster will be redrawn in the new orientation.

Using Reference Angle

Using reference angle, you must enter “r” or select “Reference” from the menu. You then indicate a different base line (not the X-axis) for the graphic angle.

```
Reference angle <0.0>:
```

- You can either enter a degree value to define the new base line in relation to the X-axis or you can define it graphically by selecting the first point for the base line.

```
Reference angle <0.0>: Second point:
```

- Select the second point for the base line.

```
New angle:
```

- Indicate the final position for the new base line by entering a value. You can also indicate the rotation angle graphically if you chose the original base point (the center of rotation) as the first point of the new base line. The selected data will rotate the same amount. The angle of rotation will actually be the angle between the reference line positions.

  For example, if the desired rotation would bring a certain line to a vertical position, you could draw the base line over that line and then

type “90” for the new angle. The default angle then will be 90 minus the angle of the base line.

- As soon as the rotation angle has been specified, the highlighted data will rotate about the base point. The highlighting will be removed.

```
Move/Rotate/Scale
```

You can select another option to change or press **[RETURN]** to terminate the command.

Using Scale

1. If you enter “s” or select “Scale” from the menu, the pasted data will be highlighted and you can change the size of the image. The default value is initially set to X=1, Y=1.

```
Base point:
```

2. Select the point about which the raster will be scaled. This point will not change its location. It also serves as the first point for the scale rectangle if you use the graphic method of scaling.

```
Scale factors <1.0,1.0>/Fit:
```

3. The data is scaled from the base point. You can type the numerical values by which to scale the X- and Y- dimensions or select “Fit” and change the height and width graphically.

If you select “Fit”, you will be prompted to select the original size.

```
Select original size:
```

Select two corners of a box representing the size of the original image.

```
Select new size:
```

Draw the window to show the relative size of the desired image to the reference box. The data that filled the original rectangle will be enlarged or compressed to fit into the new rectangle. The X and Y dimensions can be different.

After you indicate the scale by either method, the pasted data is redrawn at the new size and un-highlighted.

```
Move/Rotate/Scale:
```

4. You can select another option to change or press **[RETURN]** to terminate the command. You can further adjust the image after you

have placed it with the “previous” option in the desired command (**gMOVE**, **gSCALE**, etc.).

gRAHEAD

Type	Menu	Availability
GRAH or GRAHEAD	GTX VClean>Remove Arrow Heads	GTXRaster R2V GTXRaster CAD PLUS

Icon:

Function:

gRAHEAD erases “arrowheads” (three-sided solids).

Instructions:

```
Filter Arrow heads - All/<Select objects>:
```

Type **A** for all or press **[RETURN]** to select a group of objects

If you typed **A**, then all 3-sided solids are erased. If you chose to select objects, the following prompt is shown:

```
Select objects:
```

Window or pick objects. Press **[RETURN]** when done. arrowheads are highlighted.

Press **[RETURN]** to erase them.

gRASTER

Type	Menu	Availability
GRA or GRASTER	GTX Convert>Rasterize	GTXRaster CAD GTXRaster R2V GTXRaster CAD PLUS

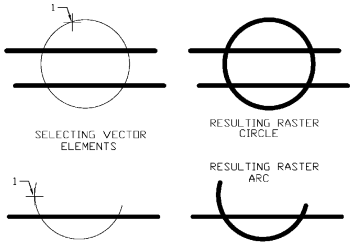
Icon:

gRASTER converts selected vector entities into raster data with a designated line width. The AutoCAD line style will be preserved.

Options:

Width Options

Table Use the width settings according to color as set in the Width Table

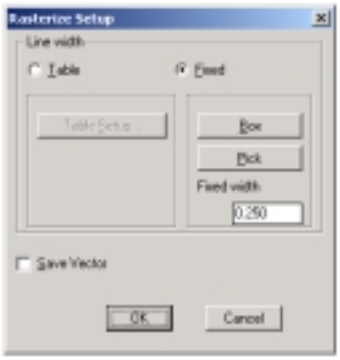


Box Define a value graphically to be used for the width of the vector selected to be converted to raster.

Value Type in a value in inches or millimeters to use for the width of the vector selected to be converted to raster.

Note:

1. ***If there is no active image, gACTIVE will be invoked before continuing with gRASTER. If there is no image attached, gCREATE will be invoked to set up an image into which raster data can be created.***
2. ***Only entities within the raster limits can be rasterized. Those selected outside the limits will be ignored or erased. When entities are partially outside, the part inside is rasterized; the part outside is erased.***



Instructions:

Dialog

1. Invoke **gRASTER**. The following prompt will appear:

```
Select objects:
```

2. Select the vector entities to be converted. When all entities to be converted are highlighted, press **[RETURN]**. The **Rasterize Setup** dialog will appear.

3. To specify line width, you can enter a **Fixed** line width, specify it graphically by drawing a **Box** or use a **Table** of vector color-to-raster line width correlations.

Fixed Line Width:

Select the **Fixed** radio button. Type a value (in mm or inch) as the width to be used for all the vector lines to be rasterized, or use the value in the **Fixed Width** text field. If you enter a value it will remain the default line width during this editing session.

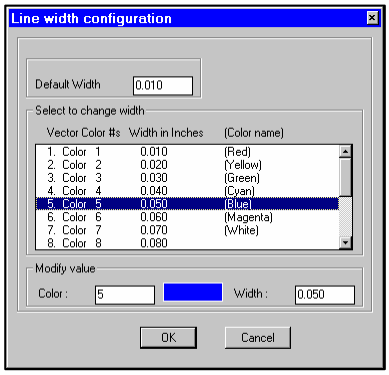
Note: ***If you defined the width previously in this session with a typed value or the "box" option, that value will appear as the default.***

Using the LineWidth Configuration Table:

a. Select the **Table** radio button and the **Table Setup** button. The LineWidth Configuration Table appears, correlating AutoCAD color numbers and line widths expressed in current units.

b. To change the width associated with a particular AutoCAD color, select that ACAD Color row. Enter the value in the **Width** text field. Select **OK** to close the dialog or select another row to change its width.

```
Enter width <.XX>:
```



c. Enter the value for the width in the units being used and press **[RETURN]**. The Width Table will reflect the changes.

d. Select another color number to change its width or press [0] and **[RETURN]** to continue the command.

The entities will be changed to raster with the widths defined by their colors.

Using Box

a. Select **Box**.

```
Select first corner of box:
```

b. Select a point.

```
Select opposite corner of box:
```

c. As you move the cursor, a rubber-banding rectangle appears with one corner at the point selected. Move the cursor until the box is the desired width and the length exceeds the width. Select the point.

The best way to use this feature is to pick a point on the edge of an existing horizontal or vertical raster line and stretch the box along the line. You can then easily match the width. The length of the rectangle can be any size that is longer than the width as the smallest side is used as the width measurement. A reference rectangle is used instead of a square to make it easier to see. As soon as the second point has been selected, the rasterization takes place.

Note: The next time you use this command, the value of the width you used will be displayed as the default fixed linewidth.

The highlighted entities will be converted to raster. Some residual vector markings overlay the raster until you redraw the image.

Using Pick

a. Select a vector entity

b. Select the **Pick** option

```
Select raster <width>:
```

c. Next select a raster entity or enter a width

A dialog box will appear with a fixed width value of the raster entity selected.

d. Select **OK**

The vector entity selected will be converted to line width of the previous raster that was selected using the **Pick** command.

AutoCAD Prompts

1. Select **gRASTER**.

```
Select objects:
```

2. Select the vector entities to be converted. When all entities to be converted are highlighted, press **[RETURN]**.

```
Raster width Box/<Table>/.01:
```

3. There are three ways to respond to this prompt. You can 1) type in a value as the width to be used for all vector lines to be rasterized for plotting; 2) use the LineWidth Configuration Table to correlate AutoCAD color numbers with line widths; or 3) use the Box option to specify a standard linewidth graphically.

Fixed Line Width:

a. You can type in a value (in mm or inch) as the width to be used for all the vector lines to be rasterized. The value in parentheses is the default value or one previously used. If you enter a value it will remain the default line width during this editing session.

Note: ***If you defined the width earlier in the session, that value will appear as the default. You can press [RETURN] to accept this value or enter a number to represent the new width. The selected entities will all be converted to raster with the designated width.***

Using the LineWidth Configuration Table:

a. If you type in “T” or “Table”, the LineWidth Configuration Table appears. The listing correlates AutoCAD color numbers and line widths expressed in current units.

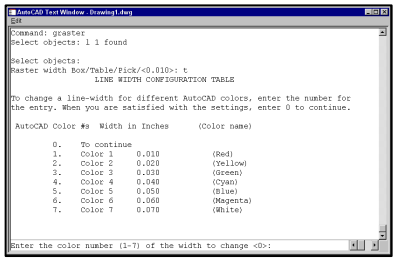
b. If you defined the width previously in this session with a typed value or the “box” option, that value will appear as the default. You can press **[RETURN]** to accept this value or enter a number to represent the new width. The selected entities will all be converted to raster of the designated width.

Note: ***The original default option is to use the Width Table set up by colors. This allows you to set different widths for entities being rasterized according to their color. If you press [RETURN] or [T], the Width Table will be displayed. The widths will be in inches or millimeters according to the unit set in GTXRAST.CFG.***

c. Enter the number and press **[RETURN]**

```
Enter width <.XX>:
```

d. Enter the value for the width in the units being used and press **[RETURN]**. The Width Table will reflect the changes.


AutoCAD Text Window - Drawing1.dwg
Edit
Command: graster
Select objects: 1 1 found
Select objects:
Raster width Box/Table/Pick/<0.010>: t
LINE WIDTH CONFIGURATION TABLE
To change a line-width for different AutoCAD colors, enter the number for the entry. When you are satisfied with the settings, enter 0 to continue.
AutoCAD Color #s Width in Inches (Color name)
0. To continue
1. Color 1 0.010 (Red)
2. Color 2 0.020 (Yellow)
3. Color 3 0.030 (Green)
4. Color 4 0.040 (Cyan)
5. Color 5 0.050 (Blue)
6. Color 6 0.060 (Magenta)
7. Color 7 0.070 (White)
Enter the color number (1-7) of the width to change <0>:

e. Select another color number to change its width or press [0] and **[RETURN]** to continue the command.

Note: ***The width settings you change will remain in effect until you change them or you exit AutoCAD.***

The entities will be changed to raster with the widths defined by their colors.

Using Box

a. At the prompt, type “B” or select “Box” from the menu.

```
Select first corner of box:
```

b. Select a point.

```
Select opposite corner of box:
```

c. As you move the cursor, a rubber-banding rectangle appears with one corner at the point selected. Move the cursor until the box is the desired width and the length exceeds the width. Select the point.

The best way to use this feature is to pick a point on the edge of an existing horizontal or vertical raster line and stretch the box along the line. You can then easily match the width. The length of the rectangle can be any size that is longer than the width as the smallest side is used as the width measurement. A reference rectangle is used instead of a square to make it easier to see. As soon as the second point has been selected, the rasterization takes place.

The highlighted entities will be converted to raster. Some residual vector markings overlay the raster until you redraw the image.

Note:

1. ***The next time you use gRASTER, the value of the width you used will be the default fixed line width.***
2. ***If the width value is less than 1 pixel, the raster width will automatically be reset to 1 pixel, regardless of the way the width was set.***
3. ***Polylines and other non-filled entities that have a width attribute will be drawn with the AutoCAD width attribute.***
4. ***Rasterization of certain entities may take a while to process. Rasterizing text and ellipses takes longer than lines, for instance. Select less data at a time to improve rasterization speeds.***
5. ***gRASTER does not convert 3-D entities***

CALS Plotter Driver

An alternative method for rasterizing vector data is to use the Raster File Format HDI plotter driver. This can be configured using the Autodesk Plotter Manager from the Windows Control Panel.

gREDUCE

Type	Menu	Availability
gREDUCE gRED	GTX CONVERT> Reduce Color Image	All Products

Icon:

gREDUCE reduces the number of colors in an image to a more manageable number of colors (between 4 to 256 colors).

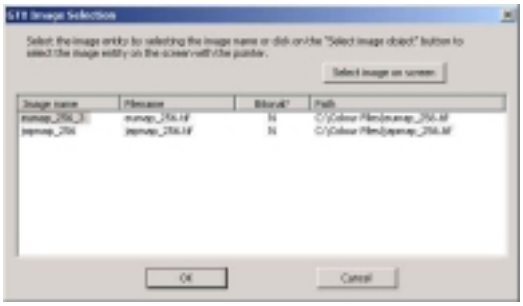
The gREDUCE command only works when you have one or more color (or grayscale) images loaded.

Instructions:

Invoke the gREDUCE command.

If you have no color/grayscale images loaded & you will get an error telling you that you don't have a suitable image for gREDUCE to work on.

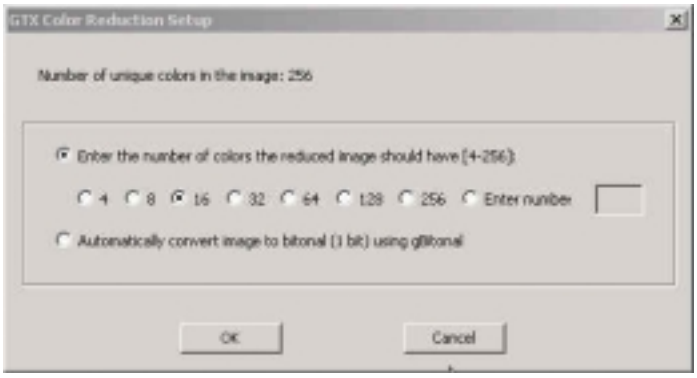
If you have more than one color/greyscale image loaded you will be offered the 'Image selection' dialog box. You can then either select the image by name or you can pick it interactively using the 'Select Image on Screen' button.



Once the Image has been selected the system will display the color reduction dialog. You can select the numbers of colors you wish to reduce to from a preset list in the range of between 4 to 256 colors.

Or you can specify the exact number of colors.

Or you can reduce to a bitonal image.



Notes:
gREDUCE only works if you have a color (or greyscale) image loaded.

You cannot use the command to increase the number of colors.

gREFLCT

Type	Menu	Availability
GREF or gREFLCT	GTX Enhance>Reflect	All Products

Icon:

gREFLCT reflects the raster within an image about the X or Y axis. This command can be useful if an image was scanned through the back of transparent media.

Instructions:

1. Select gREFLCT.

```
Select axis to mirror data about <Xaxis>/Yaxis:
```

2. Select “X” or “Y” or press **[RETURN]** to select the default value. The entire image is flipped about the chosen axis and the raster limits are rotated to the new orientation.

gRELIMIT

Type	Menu	Availability
GREL or GRELIMIT	GTX VClean>Relimit	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gRELIMIT combines the effects of AutoCAD TRIM and EXTEND commands for vector lines

Instructions:

```
Select line end point:
```

1. AutoCAD's **End** AutoSnap becomes enabled to help select endpoints. Select the end of the line you want to trim or extend.

```
Select Object:
```

2. Select the boundary line.

The line will lengthen or shorten to meet the boundary.

If the line cannot shorten or lengthen to meet the boundary, the following message is displayed:

```
Object does not intersect an edge.
```

gRESIZE

Type	Menu	Availability
GRE or GRESIZE	GTX Enhance>Resize	All Products

Icon:

gRESIZE changes the size of the raster work area. You can increase the dimensions in both positive and negative directions. This is useful to accommodate pasting in additional raster files, scaling up the drawing, or making edits that would move data beyond the existing limits. You can also reduce the work area to reduce memory requirements; for instance, when the actual data you need occupies only a small portion of the work area.

Instructions:

1. Select gRESIZE.

```
This command could fail in limited memory situations
Do you want to save the raster image first? Yes/<No>:
```

2. If you have not recently saved your data, respond “Yes”. You will be prompted for a file name and then returned to the command.

```
Select lower left corner of raster limits <X.XXX,X.XXX>:
```

3. Select a point with the mouse or type in the coordinates for the point to be the lower left corner of the work area. Negative numbers are acceptable.

```
Select upper right corner of raster limits:
```

4. Select a point with the mouse or type in the coordinates for the point to be the upper right corner of the work area. Make sure that all the existing raster data is enclosed in the resulting window. Any raster data not included will be eliminated from the database.

Lines marking the raster work area move to the new boundaries. Existing data retains the same coordinates as before.

Warning: ***When resizing an image, consider the drawing’s scale. Raster images will normally be about the same size as paper media. Ensure your image remains within a normal “paper” size and then scale it against your vector data. You don’t want to create a raster image the size of a house or a map - it will take a long time if it works at all!***

gROTATE

Type	Menu	Availability
GR or GROTATE	GTX Edit>Rotate	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gROTATE rotates selected raster data. You will define the center point and a rotation angle to specify the new orientation for the data. The rotation angle may be selected by entering a value or by picking two points to indicate the angle graphically. gROTATE can also be used to "deskew" a specified section of a drawing.

Options:

Rotation Angle Specify the rotation angle with respect to the X axis.

Reference Angle Draw a new base line and indicate the desired angle for this line.

Instructions:

1. Select gROTATE.

```
Select raster <WINDOW>:
```

2. Select the raster data to be rotated. When everything you want to be rotated is highlighted, press **[RETURN]** to continue the command.

```
Base point:
```

3. Select a point on the entity to be used as the center point for the rotation process. The entity will turn about this "anchor" point as it rotates. It will also be used as the base point for a graphic representation of the rotation angle.

```
Rotation angle <0.0>/Reference:
```

4. There are several ways to respond to this prompt. You can enter the default value, a new rotation angle, or use reference angles to graphically designate the rotation.

Using the Default Angle

a. The default angle, initially zero degrees, reflects the value used for a previous **gROTATE** operation. You can accept the default angle by pressing **[RETURN]**.

```
Delete old objects Yes/<No>:
```

Using Rotation Angle

a. You can specify the angle with reference to the X axis by typing in a value (in degrees) or by rubber banding the reference line.

b. When you designate the angle by either method, the raster will be redrawn in the new orientation.

Using Reference Angle

a. Enter “R” or select “Reference” from the menu to use a different base line (not the X axis) for the graphic angle.

```
Reference angle <0.0>:
```

b. You can either enter a degree value to define the new base line or define it graphically by selecting a point. If you select a point, you will be prompted for the second point.

```
Reference angle <0.0>: Second point:
```

Select the second point to define the line that should be rotated to a particular angle.

```
New angle:
```

c. Type in the value for the angle the new base line should take. The selected data will rotate the same amount. The angle of rotation will actually be the angle between the reference line positions. For example, if the rotation should bring a certain line to a vertical position, you could draw the base line over that line and then type “90” for the new angle. The default angle will then be 90 minus the angle of the base line.

5. Respond “yes” if you do not want to retain the original data in addition to the rotated copy.

Note:

1. ***If raster data is placed so that it is outside of the set raster drawing limits, the portion outside the drawing limits will be lost. If this happens, use UNDO, use gRESIZE to extend the raster limits as necessary, then use gROTATE to rotate the data. Nothing will be lost because all raster is within the new raster limits.***

2. ***Rotating raster data may distort it somewhat. The "line", "arc", and "circle" intelligent raster object picking methods may not work on raster data that has been rotated several times.***
3. **gROTATE** ***can rotate raster right off the image. To rotate an entire raster image 90 degrees, rotate the image entity using the*** *ROTATE* ***command, or use gTURN so that the image is automatically resized.***
4. ***Positive values rotate raster in a counter-clockwise direction.***

As soon as the rotation angle has been defined by whatever method is used, the highlighted data will rotate as specified about the base point. The command terminates.

Rotate All Images

Type	Menu	Availability
gRAI	GTX Imaging>Modify Images>Rotate All Images	All Products

Icon:

Rotate All Images invokes AutoCAD Rotate command on all image entities.

gRUB

Type	Menu	Availability
GRU or GRUB	GTX Edit>Rub	All Products

Icon:

gRUB erases raster data after it has been converted or traced to vector entities. You select the vector entities overlying the raster that is to be erased. This lets you use the raster to evaluate the conversion and then erase it easily.

Instructions:

1. Select gRUB.

```
Select objects:
```

2. Select the vector entities over the raster to be erased. When all the desired entities are highlighted, press **[RETURN]**. You will see a message indicating the percent of rub completed.

Note: ***The width at which gRUB erases is determined by the linewidth configuration table. Automatically generated polylines have no actual width, so they are not very effective for erasing underlying raster.*** gERASE **can be more effective in this situation.**

gSAVE

Type	Menu	Availability
GSA or GSAVE	GTX Imaging>Save	All Products

Icon:

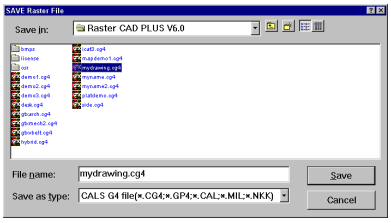
gSAVE saves changes made to a raster image.

A filename can be up to 256 characters long. If the extension is not included, the default raster format and its extension (such as ".RNL", ".RLC", or ".CG4") will be used.

TIFF subformats (uncompressed, Version 6 tiled, etc.) default to the TIFFFORMAT setting in *GTXRAST.CFG*.

Instructions:

1. Invoke gSAVE. The SAVE Raster File dialog appears:



2. Select the output format from the List Files of Type box. Enter the File Name and press OK.

3. If the file name already exists, you will be prompted to overwrite the file or cancel the save.

The drawing is saved.

Renaming an Image

If you saved the image to a new name, note that the image entity still points to the originally attached raster file. If you want the drawing to point to the new filename you must do the following:

1. Select **Insert>Raster Image...** to invoke the AutoCAD **IMAGE** command.

2. Select the GTXARCH image. Above under the **Saved Path** column you can see the original raster filename. At the bottom of the dialog you can see an “Image Found At” text box, which points at the recently saved filename.

3. Select **Save Path**. This tells AutoCAD that you want the changed filename as the one to which the image points.

Note:
1. ***The lower left corner of the drawing raster limits is set as the insertion point to be used when the file is loaded or pasted.***
2. ***Always save when leaving for any length of time and before loading new files. If performing many tasks on a single drawing, it is a good idea to save the files periodically.***

3. Select **OK**.

Saving Color Images

There is a difference in the way the gSAVE operates depending upon if you are saving a color or black & white (binary) image. Color images have a more restricted number of file saving formats.

Supported Color file formats.

When working with color images in GTX you can only save in

.tif (uncompressed TIFF),

.**bmp** (Uncompressed Bitmap),

.png (Portable Network Graphics),

.tga (Taga),.flc & fli (Autodesk FLIC) &

.pcx (PC Paintbrush) formats.

Also, if you originally loaded a **.jpg** (JFIF JPEG) file you will additionally be offered the option of saving in .jpg (JPEG) format.

gSCALE

Type	Menu	Availability
GS or GSCALE	GTX Edit>Scale	GTXRaster CAD GTXRaster CAD PLUS

Icon:

gSCALE changes the size of raster geometry within an image entity. You may scale the data about a reference point by entering X axis and Y axis scaling factors or you may scale the raster data graphically.

Instructions:

1. Select gSCALE.

```
Select raster <WINDOW>:
```

2. Select the raster data to be scaled. When all of the data to be scaled is highlighted, press **[RETURN]**.

```
Base point:
```

3. Select a point near the data selected. This point is the reference point to scale the entities about (it will not change its location). It also serves as the first point for the scale rectangle if you use the graphic method of scaling.

```
Scale factors<1.0,1.0>/Fit:
```

The value in the brackets is the default value, either the initial default of 1.0,1.0 (scale by 1 in both X and Y directions) or any values previously used with the **gSCALE** command.

4. There are several ways to respond to the prompt. You can use the default value or enter the numerical scaling factors for X and Y. You can also indicate the size graphically be selecting “Fit”.

Using the Default Scaling Factors

```
Scale factors<1.0,1.0>/Fit:
```

a. The default scaling values reflect the scale factors used for a previous **gSCALE** operation or 1.0,1.0 if the command has not been used. You can accept the default scale factors by pressing **[RETURN]**.

Entering Numerical Scaling Factors

```
Scale factors<1.0,1.0>/Fit:
```

a. Enter two values separated by a comma to indicate the X and Y scale factors respectively. To enlarge the image, enter scale factors greater than 1. To shrink the image, enter scale factors between 0 and 1 (Entering “2,2” doubles each dimension and increases the area by a factor of 4. Entering “.5,.5” cuts each dimension in half and decreases the image to 1/4 its original size.)

Using “Fit”

```
Scale factors<1.0,1.0>/Fit:
```

a. After selecting the base point, select “Fit” from the menu or enter “F”. A rubber-banding box anchored at the base point will appear.

```
Select original size:
```

b. Rubber-band a reference rectangle from the base point representing the original size of the raster data being scaled.

```
Select new size:
```

c. Rubber-band a new reference rectangle from the base point representing the new size of the raster data. The “Fit” option generates scale factors based on the size ratio between the reference rectangles.

Note:

1. **gSCALE** ***can scale raster data right outside the image entity, and the data is lost! To avoid this, choose the base point to avoid rotating the data outside the limits of the image.***
2. ***After scaling, you can easily re-select the rotated data and reposition it with*** **gMOVE** ***“previous” if necessary - this even works if the rotated data overlaps with preexisting raster.***
3. ***To expand the image, save the file and then use*** **gRESIZE** ***to enlarge the raster work area.***
4. ***Scaling a raster image with different X and Y factors will cause raster arcs and circles to become elliptical. The resulting shapes cannot be selected using the intelligent raster object “arc” and “circle” picking methods.***

5. The data is scaled to the dimensions indicated by the scaling factors. The command is terminated.

Scale All Images

Type	Menu	Availability
gSAI	GTX Imaging>Modify Images>Scale All Images	All Products

Icon:

Scale All Images invokes AutoCAD Scale command on all image entities.

gSEPARATE

Type	Menu	Availability
gSEPARATE gSEP	GTX CONVERT> Separate Color image	All Products

Icon:

gSEPARATE separates out individual colors, or selected groups of colors from a color image, & reduces them to a single binary (1 bit) image. The command can separate out to multiple binary images with each run of the command

The gSEPARATE command only works when you have one or more color (or grayscale) images loaded.

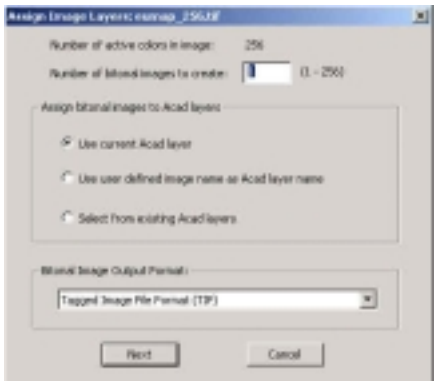
Instructions:

Invoke the gSEPARATE command.

If you have no color/grayscale images loaded & you will get an error telling you that you don't have a suitable image for gSEPARATE to work on.

If you have more than one color/greyscale image loaded you will be offered the 'Image selection' dialog box. You can then either select the image by name or you can pick it interactively using the 'Select Image on Screen' button.

Once the Image has been selected the system will display the 'Assign Image Layers' dialog.



You can enter the number of binary images you wish to create (between 1 to 256 images).

The binary images created can be assigned to different layers. The layering naming can be controlled by selecting one of three options:

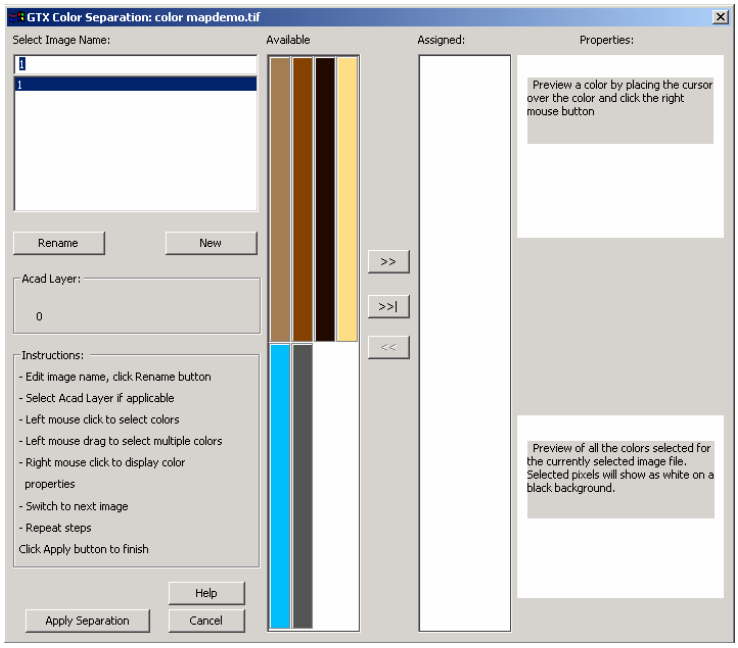
1) **Use current ACAD Layer**. In this instance the binary images will be put on the current AutoCAD layer.

2) **Use User defined image name as Acad layer name.** This option will use the layer name to create a new layer with that name & the image will be placed upon that layer.

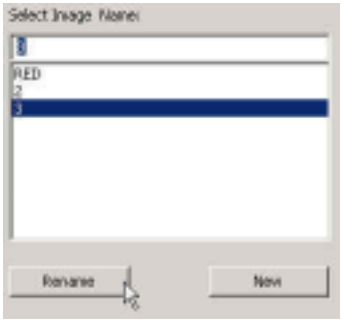
3) **Select from existing Acad Layers.** This prompts the user to select the layer from the existing list of defined layers, for every new binary image created.

Next you can select the file format for the new binary images. Click on the down arrow to see & select the image format.

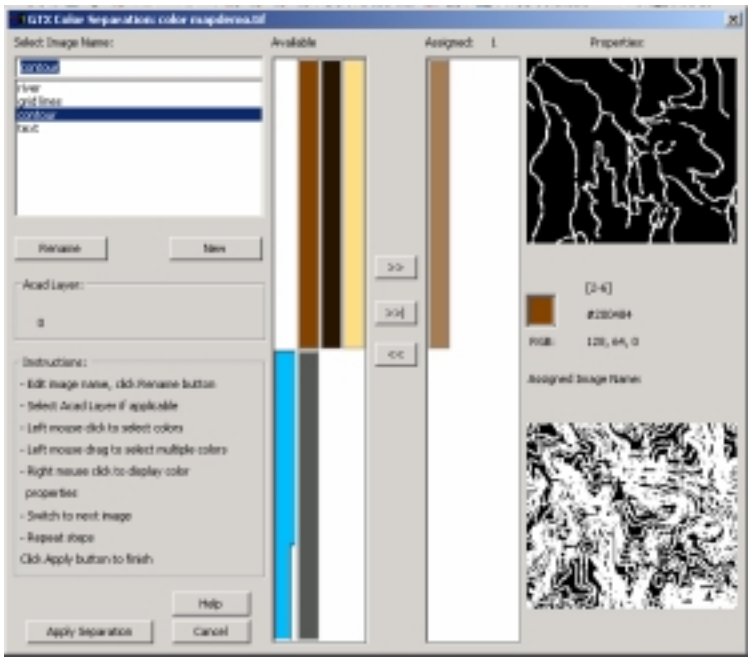
Select **NEXT** to move to the Color Separation dialog.


GTX Color Separation: color mapdemo.tif
Select Image Name:
Available
Assigned:
Properties:
1
1
Rename
New
Acad Layer:
0
Instructions:
- Edit image name, click Rename button
- Select Acad Layer if applicable
- Left mouse click to select colors
- Left mouse drag to select multiple colors
- Right mouse click to display color properties
- Switch to next image
- Repeat steps
Click Apply button to finish
>>
>>|
<<
Preview a color by placing the cursor over the color and click the right mouse button
Preview of all the colors selected for the currently selected image file. Selected pixels will show as white on a black background.
Help
Apply Separation
Cancel

You can rename your binary image & layer in the top left hand corner of the dialog. By default the image names are numbers 1,2,3 etc. Highlight the layer number & you can enter a new name in the box above. Then select **RENAME** to change the image name. You can also add new images at this stage by selecting the **NEW** button.



You can now move onto select the colors for a particular binary image.



Firstly highlight the image name you wish to work on. Then using the cursor ‘drag & drop’ the required colors from the left (Available) payne into the right (Assigned) payne. You can pick the colors individually or in blocks. To select a block of colors **hold down** the left mouse button over the group of colors you wish to select.

Dialog operation instructions are:

- Edit image name, click **Rename** button

- Select Acad Layer if applicable

- **Left mouse click** to select colors

- **Left mouse drag** to select multiple colors

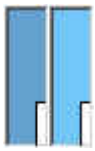
- **Right mouse click** to display color properties

- Switch to next image

- Repeat above steps

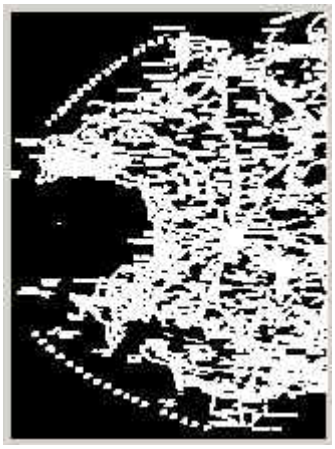
- Click **Apply** button to finish

Colors with a notch in the bottom Right Hand corner indicate that they are colors that have already been selected on another image.



To help you select the correct colors & information the dialog automatically displays a view of the selected data on that layer.

When you have correctly assigned the colors to your respective images/layers select the **Apply Separation** button to create the new binary images.



Notes:
gREDUCE only works if you have a color (or greyscale) image loaded.

Anti-Aliasing
Some color images are scanned with the 'anti-aliasing' option turned on. Anti-aliasng can enhance the quality of some images, particularly photographs. However it is not ideal for images with solid fill color as It tends to mix colors to achieve a more blurred image.

Whilst the gSEPARATE command will work with anti-aliased images the results may not be as good as required. As such we recommend that, if possible, images be scanned with anti-aliasing turned off.

gSETLAY

Type	Menu	Availability
GSETLAY GSL	GTX VClean>Set Layer	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gSETLAY sets the current layer to that of a specified entity

Instructions:

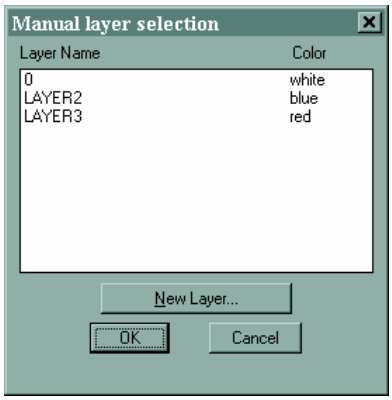
```
Dialog/<Select object>:
```

1. Select an object whose layer you wish to make current **or** type **D** to use the dialog.

Select Object:

The selected object's layer becomes current.

The following dialog appears:



Select the layer you wish to make current and press **OK** or select **New Layer**.

Pressing OK makes the selected layer current.

Selecting **New** starts the **New Layer Creation** dialog:

Type the name and choose the color for a new dialog. Press **OK** when done.

The new layer becomes current.

gSMOOTH

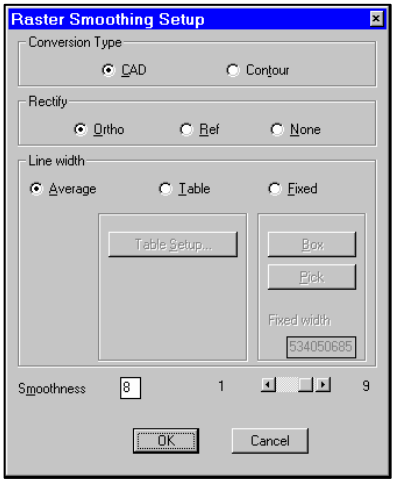
Type	Menu	Availability
GSM or gSMOOTH	GTX Enhance>Smooth	GTXRaster CAD GTXRaster R2V GTXRaster CAD PLUS

Icon:

gSMOOTH smoothes raster objects in a selected portion of the raster data. **gSMOOTH** can also make raster lines orthogonal or parallel to a specified angle, combine fragmented raster lines. gSMOOTH can smooth raster linewidth to a fixed value or snap raster linewidth to a series of user-defined linewidths. By smoothing raster, gSMOOTH can reduce the file size by up to 30 percent.

Instructions:

Dialog:



Conversion Type indicates the type of raster-to-vector conversion being used to smooth the raster. **CAD** interprets raster as lines, arcs and circles. **Contour** interprets raster as polyline contours.

Ortho improves the drawing by snapping lines to horizontal or vertical.

None smoothes the data exactly as it appears without any rectification.

Reference snaps lines close to any reference angle to that angle and parallel lines at this angle separated by a distance close to the offset distance will snap to the offset distance.

Line Width Options

Box defines a value graphically to be used for the width of the data selected to be smoothed.

Value applies a literal value to use for the width of the selected data to be smoothed.

Note: ***Be sure to enter values in current units (mm or inches), not in the current AutoCAD Drawing Unit. The graphically defined width will also be translated to mm or inches when it appears as the default.***

Average smoothes raster geometry to an average of that segment's width.

Table snaps the lines to the nearest value listed in the Width Table.

AutoCAD Prompts

1. Select **gSMOOTH**.

```
Select raster <WINDOW>:
```

2. Select the raster to be smoothed. When all the data to be converted is highlighted, press **[RETURN]**.

```
Width Box/Table/<Average>/0.01:
```

3. There are several ways to respond to the prompt. You can enter a value to be the fixed line width for all selected data or you can select this value graphically with the "Box" option. You can average each raster element's width or you can set up a Table of LineWidths to which raster elements are snapped.

Using a Fixed Line Width

a. The value shown in the prompt is the value used last or the one set for **RasterWidth** in the configuration file. To accept the default value, press **[RETURN]**. Type a number that represents the width in current size units.

Using Box

a. At the prompt, type "B" or select "Box" from the menu.

```
Select first corner of box:
```

b. Select a point on the edge of a horizontal or vertical raster line.

```
Select opposite corner of box:
```

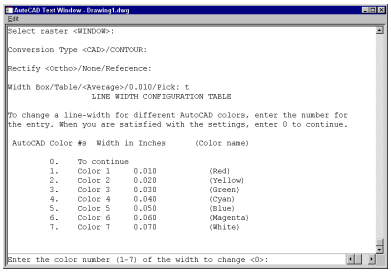
c. As you move the cursor, a rubber-banding rectangle appears with one corner at the point selected. Stretch the box along the line and match the width. The length of the rectangle can be any size that is longer than the width as the smallest side is used as the width measurement. Select the second point.

Using The Average Width

a. At the prompt for width, type “A” or select **Average** from the menu. Each element will be smoothed to its average width. If parts of a line are significantly different in width, they will be averaged separately.

Using The LineWidth Table

At the prompt for width, type “T” or select **Table** from the menu. The LineWidth Table will be displayed. The widths will be displayed in the units set in *GTXRAST.CFG*. This allows you to set up to seven different widths to which the lines snap.


AutoCAD Text Window - Drawing1.dwg
Select raster <WINDOW>:
Conversion Type <CAD>/CONTOUR:
Rectify <Ortho>/None/Reference:
Width Box/Table/<Average>/0.010/Pick: t
LINE WIDTH CONFIGURATION TABLE
To change a line-width for different AutoCAD colors, enter the number for the entry. When you are satisfied with the settings, enter 0 to continue.
AutoCAD Color #s Width in Inches (Color name)
0. To continue
1. Color 1 0.010 (Red)
2. Color 2 0.020 (Yellow)
3. Color 3 0.030 (Green)
4. Color 4 0.040 (Cyan)
5. Color 5 0.050 (Blue)
6. Color 6 0.060 (Magenta)
7. Color 7 0.070 (White)
Enter the color number (1-7) of the width to change <0>:

Note: The colors do not affect raster smoothing. In this command they only determine the title under which a line width is defined.

c. Enter the value for the width in the size units being used (inches or millimeters) and press **[RETURN]**. The Width Table will reflect the new value.

d. Select another color number to change its width or type “0” and **[RETURN]** to continue the command. You can set up to seven different widths.

```
Rectify <Ortho>/None/Reference:
```

4. There are several ways to respond to the prompt. The default is orthogonal rectification. You can create reference angles to snap lines to a particular non-orthogonal angle (such as hatching) or you can use no rectification.

Using Orthogonal Rectification

a. If “Ortho” is the default mode, just press **[RETURN]** to accept the default of orthogonal rectification. Otherwise, type “O” and **[RETURN]**. All lines within a few degrees of 0 and 90 degrees will be rectified to 0 and 90 degrees.

Using Reference Angle(s)

a. Type “R” or select **Reference** from the menu. The option will prompt you to draw a line showing the reference angle to which lines will be snapped.

```
First point for snap angle:
```

b. Select the first point to define the angular line.

```
Second point for snap angle:
```

c. Select the second point to define the angle.

```
Parallel alignment offset <0.0>:
```

d. This value determines the distance between the imaginary grid lines parallel to the given reference angle. Type in a value in current drawing units. Using the (0.0) value which is always the default means no grid snapping for this angle.

```
First point for snap angle:
```

e. You can define another reference angle and grid or press **[RETURN]** if you don’t want to use another one. When you are finished defining the angles, press **[RETURN]**.

5. After you respond to the last prompt, the conversion will take place and you will see the message “Processing Image...”

gSPECKL

Type	Menu	Availability
GSP or GSPECKL	GTX Enhance>Speckle	All Products

Icon:

gSPECKL filters and removes speckles from the raster image. gSPECKL can also fill in small holes in solid raster.

Options:

Pick Options

gSPECKL allows only Window, PWindow or View raster picking to and to add or remove raster data to/from the selection set.

Mode Options

Delete Remove speckles from the raster.

Fill Fill in small holes in the raster.

Instructions:

1. Select gSPECKL.

```
Speckle size <0.00>/Box/Pick:
```

2. There are two ways to respond to this prompt. You can enter a value or you can use the “Box” option to graphically specify the speckle size.

Entering a Value

a. Specify an absolute value and hit **[RETURN]**. This value will represent one side of a square area. The speckles or holes to be affected must be within this tolerance.

Using a Box

a. To use the graphics method, type “B” or select **Box** from the menu.

a. Single-click with the left mouse button on a sample speckle in the image. Raster data of that size and smaller will be considered to be speckles.

```
Select first corner of box:
```

b. You may want to window an actual speckle or hole to gauge the proper size. Select a point for one corner of the window or box. A rubber-banding box will appear with one corner attached at the point.

```
Select opposite corner of box:
```

c. Drag the box to the desired size and select the second point. The largest side of the box will be used as the reference dimension to define maximum speckle/hole size.

3. After specifying the speckle size, the following prompt will appear:

```
<Delete Speckle>/Fill hole:
```

4. This sets the mode of the **gSPECKL** command. Select the desired mode from the menu or type its abbreviation. Type “D” and **[RETURN]** for “Delete” or type “F” and **[RETURN]** for “Fill”.

```
Select raster <WINDOW>:
```

5. Select the area of the drawing to be processed with the “Window”, “PWindow” or “View” option. All of the speckles or holes of the designated size or smaller in the window will be highlighted.

CAUTION:

1. ***Set the speckle size smaller than punctuation marks such as the period (.) and colon (:). If your speckle size is larger than these, they will be erased and valuable information could be lost!***
2. ***With large drawings, memory demands can be great for this command. If you have problems, despeckle portions of the drawing, saving in between (***gSAVE**).***
3. ***In the “Select” mode, the “window” option only adds speckles that are entirely inside the window and “PWindow” selects speckles that are entirely or partially inside the area. In the “Remove” mode, either window option removes data up to the window boundary.***

6. Continue to create a selection set using “Add” and “Remove” to define the area to process. When you are satisfied with the area selections, press **[RETURN]**. The highlighted speckles or holes in the display will be processed.

gTCONFIG

Type	Menu	Availability
GTCFG or GTCONFIG	GTX Convert>Text Config	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gTCONFIG sets up parameters for text IOP and the text conversion commands, gTCONVRT and gTRAIN.

Instructions:

Text Configuration dialog has four panes: Raster Input, Character Recognition, Word Recognition, and Text Output. This is the order in which GTX Intelligent Character Recognition (ICR) functions:

1. ICR analyzes the selected raster text, filters out raster that is too large or small to be text, and gathers string formation information to assist in the detection of space characters.

2. If a piece of raster appears to be two or more touching characters, that raster is broken down into its component characters. Raster text is compared to samples recorded in character recognition (.ICR) files. A guess is made as to each character's identity. Each guessed character is assigned a **confidence level**.

   If only character recognition is being performed, characters with a confidence above the Auto-Convert Threshold are automatically converted into text. Characters with a confidence below that threshold are presented in the Character Verification dialog.

3. When Word Recognition is performed, the Auto-Convert Threshold is not used. Instead, characters are formed into strings which are then compared to words and patterns in the dictionary files (.DCT). These files contain words and patterns that are likely to appear in converted drawings.

   If a recognized word is close to one found in the dictionary, but a character is missing or perhaps incorrectly recognized, that character can be changed so the word matches the one found in the dictionary. One threshold, Force Fit, controls how close a word has to be to a

dictionary term for it to be changed. Another threshold, Verify, determines how likely the user will be interrupted

4. When using character recognition (not word recognition), ambiguous characters are shown to the user so that 0 and O, 1 and I, 5 and S, and other pairs of ambiguous characters appear correctly in the AutoCAD text. Regardless of the conversion method, ICR generates AutoCAD text at user-specified size, using the font of the current text style.

Raster Input

The Raster Input pane contains parameters that control the interpretation of incoming raster text characters and space recognition.

IOP

Sets the minimum and maximum size raster text “blobs” that textwin or textline IOP methods are allowed to select. Text IOP separates raster text from touching raster geometry (i.e., text with a touching or intersecting raster underline). Text IOP needs to know the typical size of text characters so it can tell them apart from their surroundings. It also selects the minimum and maximum size raster that gTCONVRT will attempt to recognize as text. Entities larger or smaller than these values will not be selected by text IOP or will be ignored by text conversion if another selection method was used.

Min Char Size

Sets the smallest size of raster that text IOP will select or that **gTCONVRT** will attempt to recognize. The default value is set by the **CharMinSize** parameter in *GTXRAST.CFG*.

Max Char Size

Sets the largest size or raster that text IOP will select or that **gTCONVRT** will attempt to recognize. The default value is set by the **CharMaxSize** parameter in *GTXRAST.CFG*.

Note: ***Set the Min Char Size between the sizes of speckles and of typical period/full stop raster characters (“.”). That way, speckles are not converted but small text characters are. Also, if there are many “touching” Characters, you may want to double or triple the Max Char Size so that gTCONVRT doesn’t ignore touching raster text.***

String Formation

Controls how gTCONVRT merges separated raster strings by inserting spaces in recognized text, how it breaks colinear text into separate AutoCAD text entities.

Space Size

Sets the distance between two characters (in terms of the percentage of a character’s width) required before a space character is inserted between the two text strings.

Max # Spaces

Sets the maximum number of the above-mentioned space characters allowed before **gTCONVRT** separates the text into separate AutoCAD text entities. If two text strings are far enough apart, they will exceed this “breaking point” and be portrayed by two separate AutoCAD text entities.

Alignment Offset

Sets the minimum vertical distance (relative to both of the text strings’ orientations) between separate lines of text in terms of a percentage of a typical character’s height. By default, this parameter is set to 0%, meaning that the top of one character could be level with the bottom of another and they would still be merged, into the same AutoCAD text string.

Character Recognition

Recognition Files Lists the *.ICR* files being used by **gTCONVRT** to recognize raster text.

Open/New Opens a recognition file or creates a new recognition file and sets it for training.

Close Closes the selected recognition file.

Train Sets the selected recognition file for training.

Save Saves a trained recognition file.

Word Recognition

Dictionary Files

OPEN or NEW – Opens an existing ASCII dictionary file (*.dct) or creates a new one from scratch.

TOGGLE TRAIN STATUS – Controls whether the selected dictionary file is being trained. When you make corrections during gTCONVRT, new words will be added to the dictionary file that is being trained. These may later be edited with a standard text editor, such as Windows Notepad.

CLOSE – Closes the selected dictionary file

SAVE – Saves changes made to the selected dictionary file (only if it was being trained).

Thresholds

Verify – Controls the likelihood that gTCONVRT will display the text verification dialog to verify its guess at what a given word was. If the average confidence of all characters in the text string falls below this value, the text verification dialog will appear.

ForceFit – Controls how hard gTCONVRT will try to change characters to make a given string fit an existing dictionary file word or pattern.

Text Output

2. Text recognition works on one orientation of text at a time. The default orientation is zero degrees. To recognize at 90 degrees, Delete **0** from the orientation *list box*, type **90** in the orientation *text box* and press [RETURN].

3. To use a pre-trained recognition file (suffix is .ICR) select **Open**. The **Open Character Recognition/Training File** dialog appears. Choose the .ICR recognition file and select **OK**.

4. If you want to train this or any other opened recognition file on the new drawing, select **TRAIN**. The letter "T" will appear to the left of the training file.

Note: ***When you train a character recognition file, you will need to save it afterwards! To save, go back into the text configuration dialog, select the Character Recognition pane, and Save. THE FILE IS SAVED ONLY AFTER YOU CLOSE OUT OF THE TEXT CONFIGURATION DIALOG! After selecting SAVE, select OK to make the dialog save the file.***

5. If training a new recognition file, set the **Auto-Convert Threshold** to **100** to force the **Character Validation** dialog to appear for every character. If working with an existing recognition file, a value of 70 to 90 will be preferable so the dialog only appears for uncertain characters.

6. Set the values for IOP minimum and maximum character size to limit the raster selected with Text IOP.

7. The **String Formation** parameters should work well at the default settings.

8. Leave the **Save Raster** button un-selected to keep raster text as it is being converted to AutoCAD text.

9. Select **OK**.

Orientation Sets the text orientations allowed to be recognized from raster text characters. The default list is established by the CharOrient parameter in *GTXRAST.CFG*.

Ambiguous Characters

Lists characters that could be easily misrecognized for another (i.e., the letter “O” could easily be drawn the same way as the numeral “0”. Therefore, it is common for each of these characters to be included in this list).

Auto-Convert Threshold

This is a simple but important parameter. It determines how frequently the gTCONVRT command asks you to validate its guess at characters. If the confidence level of a recognized character is below this Auto-Convert Threshold, then the Character Verification dialog will appear, allowing you to see the character for yourself and override the program’s attempt at recognizing the character.

Note:

1. ***The Auto-Convert Threshold is the Confidence Level above which a character must be recognized for it to be automatically converted to text without using the verification dialog. This is set by the* CharThreshold *parameter in* GTXRAST.CFG*.***
2. ***With a trained recognition file, gTCONVRT should accurately recognize legible characters. Recognition of text in messy drawings may be unreliable.***
3. ***gTCONVRT assigns a* Confidence Level *from 0 to 100 to each character. Confidence measures the degree to which a raster character matches those on which the recognition file has trained.***

Text Sizes Lists the sizes allowed for AutoCAD text resulting from raster text recognition during **gTCONVRT**. Resulting text will be snapped to the nearest perceived text size. The default list is established by the **TextHeight** parameter in *GTXRAST.CFG*.

Save Raster If deactivated, gTCONVRT will delete raster text as it is converted to AutoCAD text. We recommend you normally leave this parameter on so the original raster text remains for final text checking purposes/QA.

gTCONVRT

Type	Menu	Availability
GTC or GTCONVRT	GTX Convert/Text Convert	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gTCONVRT converts raster text to AutoCAD text entities. Invokes the text editor window, allowing you to systematically check the results of the recognition process. This command can perform two tasks:

- It converts selected raster text to AutoCAD text entities.

Warning: ***The Character Verification dialog is actually a separate windows application. Because of this, if you happen to click somewhere within AutoCAD's window, it will appear to disappear and lock up AutoCAD. Use [ALT-TAB] to return to the Character Verification application if this happens.***

- If a recognition file is set for training, it can train it on new text characters.

CHARACTER RECOGNITION INSTRUCTIONS:

1. Invoke **gTCONVRT**.

2. If **gTCONFIG** has not yet been invoked during the AutoCAD session, **gTCONVRT** invokes it before beginning.

```
Select raster <WINDOW>:
```

3. Use the best IOP method for selecting the desired raster text. TextWin and TextLine were especially designed for this command, though Fence, Inside and Window also work.

4. **gTCONVRT** recognizes and assigns a confidence level to each separate raster "blob" selected in step 3.

5. Two kinds of characters will appear in the **Character Verification** dialog; (a) those that were recognized at a confidence below the **Auto-Convert Threshold** or (b) those that were listed as "Ambiguous" in the **gTCONFIG** dialog.

Character Validation: character recognition thought this "D" was an "O".

6. Depending on the results of character recognition, accept or correct the character.

Using the Character Validation Dialog

Program's Guess	Action
Correct	Press Return
Wrong	Type the correct character(s) and press **[RETURN]**
"Spurious" (The raster is not really a character)	Select **Ignore**. Character will not be trained and will be recognized as a character.

7. Characters whose confidence is above the Auto-Convert Threshold are automatically converted to AutoCAD text, bypassing the Character Validation dialog.

8. **gTCONVRT** ends. To edit or change resulting text, use the AutoCAD **Edit/Properties** or **Change** commands.

Options:

Ignore Ignores the current character. Use this if a single character is represented by two separate pieces of raster - ignore one half and correct the other so the correct text is written.

Cancel Ends recognizing all raster in the selection set. Returns to command prompt. No AutoCAD text entities result.

Train CR Setting a recognition file for training in **gTCONFIG** activates a "Train CR" section in the lower left corner of the Character Verification dialog.

If training a recognition file, the Character Verification dialog will train on each character that appears. If the raster that appears is a poor representation of that character (for example, a character that was scanned poorly and is either missing a part or is attached to some geometry), select **No** before accepting or correcting it. This way character recognition is not trained on misleading raster text.

WORD RECOGNITION INSTRUCTIONS:

To recognize words rather than individual characters, set the **mode** switch to Word on the **Text Output** pane of the text configuration dialog (See **gTCONFIG**, page 205).

Word recognition otherwise works very similarly to character recognition, except that a word verification dialog appears instead of the character verification dialog. You are given the opportunity to change the word before it is converted into AutoCAD text.

You can set a dictionary file to train during conversion. This adds new words to the training dictionary, which is really just an ASCII text list of words that are likely to be in your drawings. Open *BASE.DCT* or *USER.DCT* in Notepad for an example.

gTRACE

Type	Menu	Availability
GT or GTRACE	GTX Convert/Trace Vectors	GTXRaster CAD GTXRaster R2V GTXRaster CAD PLUS

Icon:

gTRACE traces over raster objects with vector entities. For a straight line, two points are picked to determine the extents of the raster line. Circles and arcs can also be copied to vector by picking three points.

Note: ***If vectorizing raster geometry depicted in a special linetype, you might want to establish a current AutoCAD layer with that linetype first. The resulting vector geometry is placed on the current AutoCAD layer and is rendered in its linetype.***

Vector entities will be created using the current image and linetype settings.

Options:

Line Default option. Trace a raster line or series of lines with one vector line. Intersections are preserved. If points are picked beyond the endpoints of a line it will not be extended.

Circle Trace a raster circle or series of arcs with a vector circle. A raster circle or arc selected with the “circle” option will be traced as a vector circle.

Arc Trace a raster arc or series of arcs with a vector arc. If points are picked on a portion of a line or raster arc, only the portion between the points will be traced. You can use the “arc” option to trace part of a circle, part of an arc or a whole arc.

Instructions:

1. Select **gTRACE**.

```
Select raster <LINE>:
```

2. The default mode begins as “line”. Select another from the menu or type the first letter of the name and press **[RETURN]**. You will be prompted to select points.

Using Line

a. Select the first point at one end of the line or line segments to be traced.

```
Select other end of reference line:
```

b. Select the second point on the opposite end of the line or line segments that you are tracing.

c. Continue to trace another line or select another option. Press **[RETURN]** to exit the command.

Using Circle

a. At the prompt, select “circle” or type it followed by **[RETURN]**. You will be prompted to select three points to define the circle to be copied.

```
Select point on circumference of circle:
```

b. Select a point on the circumference of the circle.

```
Select second point for circle:
```

c. Select another point on the circumference of the circle.

```
Select third point for circle:
```

d. Select a third point on the circumference of the circle. The circle will be overlaid with a vector circle on the current AutoCAD layer. Continue to trace another circle or select another option. Press **[RETURN]** to exit from the command.

Using Arc

a. At the prompt, select “arc” or type it followed by **[RETURN]**. You will be prompted to select three points as if you were drawing a three-point arc.

```
Select start point of reference arc:
```

b. Select a point at one end of the arc.

```
Select point on arc:
```

c. Select a point near the midpoint of the arc.

```
Select end of reference arc:
```

d. Rubber-band the arc so that it overlays the arc to be traced and select the point.

```
Select raster <ARC>:
```

e. The arc will be overlaid with a vector arc. Continue to trace another arc or select another option. Press **[RETURN]** to exit from the command.

gTRAIN

Type	Menu	Availability
GTR or GTRAIN	GTX Convert/Text Train	GTXRaster R2V GTXRaster CAD PLUS

Icon:

While training files in gTCONVRT, mistakes can be made. gTRAIN searches through a recognition file and lets you correct or delete mistakes made during training.

Warning: ***The Character Verification dialog is actually a separate windows application. Because of this, if you happen to click somewhere outside this dialog in the AutoCAD window it will appear to disappear and lock up AutoCAD. If this happens, use [CTRL-ESC] or [ALT-TAB] to return to the Character Verification application.***

gTRAIN searches through a training recognition file for specified characters or orientations of characters and displays these in the Character Verification dialog. It displays each raster text sample, allowing you to keep, change or discard each character sample. Changes are stored to the recognition file when it is saved and closed within **gTCONFIG**.

Note: ***If you select both of these options, gTRAIN will search for the specified characters at the specified orientations.***

Search Options:

Training Characters Searches for specified characters.

Orientations Searches for characters at specified orientations.

Editing Options:

Correct Replace the identity displayed by the Character Verification dialog with a new character identity (an “F” was trained as “P”; typing F will correct the typo).

Keep Accepts the character evaluation of the sample raster text.

Discard Discards the current sample raster text.

Cancel Cancels the **gTRAIN** command, making no further changes. Changes before selecting **Cancel** are made to the *.ICR* file.

Instructions:

1. Select **gTCONFIG**.

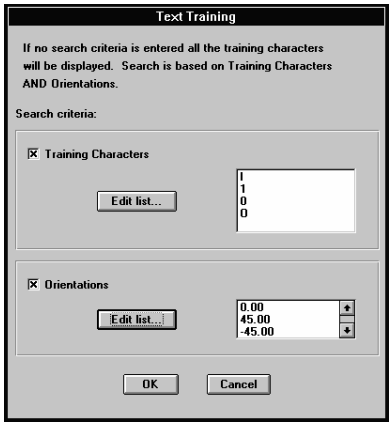
2. The Text Configuration dialog appears.

3. Open a recognition file or select one that is already loaded.

4. Set the file to **Train**. “ON” appears below the **Train** button.

5. Select **OK**.

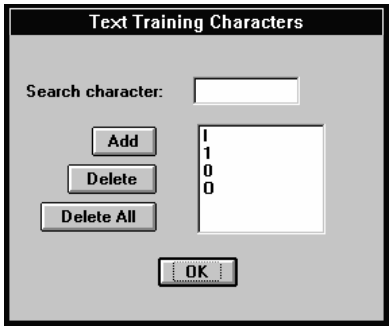
6. Invoke **gTRAIN**. The Text Training dialog appears:



Text Training dialog

7. If you leave the “Training Characters” and “Orientations” check boxes empty, **gTRAIN** will display every character in the training recognition file. The characters to be displayed can be limited to certain characters or orientations.

8. To limit the search to only certain characters select **Training Characters** and select **Edit List...**. The Text Training Characters dialog appears:

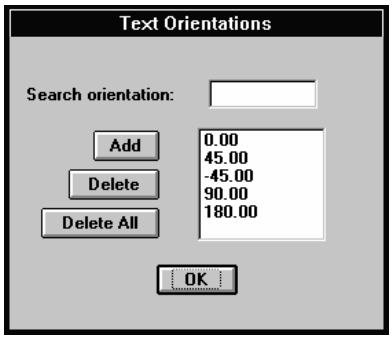


Text Training Characters dialog

9. Build a list of individual characters to observe with **gTRAIN**. Enter characters separately.

Note: ***If you enter a multi-character string the command will search for raster characters that have been recognized as that string (i.e., you could type the unicode \U+2205 to search for the unicode text diameter symbol if you had previously trained that using gTCONVRT).***

10. To limit the search to characters at specific orientations check the **Orientations** box and select **Edit list...**. The Text Orientations dialog appears:



Text Orientations dialog

11. Add each required orientation to the list, then select **OK**.

12. Back in the Text Training dialog, verify that the lists are correct, then select **OK**. The Character Verification dialog appears:

Character Verification dialog

The dialog will present each raster text sample, its trained identity and its orientation (i.e., In 104, the raster is displayed in the top half of the dialog and the character is recognized as the number “7” at 45 degrees in the lower half).

If the evaluation is correct, as with **gTCONVRT**, press **[RETURN]** or select **KEEP** to accept the identity of the raster text sample and proceed to the next sample.

If the evaluation is incorrect, but is still a good example of that character at its orientation, make the necessary corrections to the text id and its orientation, then press **[RETURN]** or select **KEEP** to make the change and proceed to the next sample.

If the evaluation is incorrect and is also a bad example (unidentifiable or at least very messy) select **Discard** to remove the text sample from the recognition file.

To cancel the **gTRAIN** command, select **[CANCEL]**. All changes made prior to cancelling the command will have been saved in memory.

To Keep Your Changes

gTRAIN does not automatically save changes to the recognition file. To write the changes to the file invoke **gTCONFIG** and save the training recognition file. If you choose to keep the recognition file as it was when it was first loaded, you can close it without saving changes.

gTURN

Type	Menu	Availability
GTU or GTURN	GTX Enhance/Turn	All Products

Icon:

gTURN quickly rotates raster data in the active image by a multiple of 90 degrees. This also swaps the image's X and Y raster limits.

Note: ***This can be automatically done by gATTACH when attaching raster files that have accompanying .REF files by setting the RefRotate to 2 for TURN.***

This command is useful when you are working with images that have been scanned sideways and appear sideways when attached within AutoCAD.

Options:

90 Rotate the raster data counterclockwise 90 degrees.

180 Rotate the raster data counterclockwise 180 degrees.

270 Rotate the raster data counterclockwise 270 degrees.

Instructions:

1. Select **gTURN**.

```
Specify rotation angle <90>/180/270:
```

2. Enter the angle or press **[RETURN]** for the default. The image raster data is rotated.

gVECTOR

Type	Menu	Availability
GV or GVECTOR	GTX Convert/Draw Vectors	GTXRaster CAD GTXRaster R2V GTXRaster CAD PLUS

Icon:

gVECTOR traces raster with lines, arcs or circles like **gTRACE**. Unlike **gTRACE**, **gVECTOR** erases originating raster data.

gVSKEW

Type	Menu	Availability
GVS or GVSKEW	GTX VClean/Skewline	GTXRaster R2V GTXRaster CAD PLUS

Icon:

gVSKEW straightens skewed lines so they become orthogonal (at a 0 or 90 degree angle).

Instructions:

```
Select objects:
```

Select lines to deskew.

```
Enter tolerance angle (1-10)<1.00>:
```

Enter the degrees of tolerance for deskewing lines.

Lines within that tolerance of 0 or 90 degrees are straightened.

gWARP

Type	Menu	Availability
GW or GWARP	GTX Enhance/Warp	GTXRaster CAD GTXRaster R2V GTXRaster CAD PLUS

Icon:

gWARP corrects distortion in a raster image by stretching the image data between source and destination points.

Options:

The Image Warp dialog establishes warp source and destination point pairs. These point pairs define the way the image is to be stretched.

Add Point Pairs creates one pair at a time.

Generate Grid creates a lower left corner, an upper right corner, and intermediate grid points.

Instructions:

Warping requires the definition of source and destination point pairs. When CMDDIA is set to 1, the Image Warp dialog allows the creation of individual point pairs or an entire array of them. When CMDDIA is set to 0, a series of prompts gathers the same information.

Add Point Pairs

The Add Point Pairs button lets you add individual pairs of source and destination points.

```
Source point on the drawing (1):
```

1. Type or select a point on the image representing a known coordinate.

```
Warp point (#.###,#.###):
```

2. Type or select the real location to which the source point is to be warped or displaced.

```
Source point on the drawing (2):
```

3. Enter another source point or press [RETURN] to go back to the **Image Warp** dialog.

The specified points appear in the **Coordinate List Table**.

Generate Grid

The Generate Grid button lets you create a rectangular grid of destination points and then for each point, enter the source points. This is backwards from the prompts for Add Point Pairs, but it provides a convenient way of generating a list of known real coordinates and then provides the location of each of those features in the raster image.

```
Select base point of grid:
```

1. This point may be the lower left corner of the image, or one corner of a grid of known coordinates.

```
Select opposite corner of grid:
```

2. Select the corner opposite the base point. This defines the total area the grid will occupy.

```
Select first corner for cell size:
```

3. Select one corner to define the cell size. This might be the same point as the base point.

```
Select opposite corner for cell size:
```

4. Select the other corner of the cell to define its overall size. The grid will fill up with cells whose size is defined by the first and opposite corners.

For each grid point generated by steps 1-4, the following prompt will appear:

```
New source point on the drawing (#.###,#.###):
```

5. A line will be rubber-banding from one of the grid points. Select the raster point nearby that is supposed to be representing this real point in space.

When all the grid (destination) points have prompted for their respective source points, the **Image Warp** dialog will re-appear showing the entire list of point pairs in the Coordinate List Table.

Save List

The **Save List** button saves the list of point pairs in an ASCII text file. The default filename is *warp.txt*.

Delete Point Pair

Deletes the selected point pair in the Coordinate List Table.

Modify Point Pair

Re-enters the selected point pair in the Coordinate List Table.

Clear All Points

Erases ALL point pairs in the Coordinate List Table.

Prompt Instructions

When CMDDIA = 0, the following prompts are issued instead of command dialogs.

```
Enter number of warp points:
```

Enter the number of warp points for **gWARP** to create.

```
Source point on the drawing (1):
```

Select or enter the coordinates of the first source point. This will be the location in the raster image that will be stretched to a new (destination) position.

```
Warp Point (#.###,#.###):
```

A rubber-banding line will stretch from the source point to the cursor. Select or enter the coordinates of the destination point. This will be the location to which the source point is to be stretched.

```
Source point on the drawing (2):
```

Continue entering source and destination point pairs until all the warp points are done.

```
Now warping image
```

Appendix 1: Glossary of Terms

Term	Definition
Active Image	The image currently prepared by the GTXRaster CAD series for raster editing or conversion.
ASCII	American Standard Code for Information Exchange - Pronounced “Ask-ee”. The code used by most computers to represent text.
Attach	AutoCAD lets you “attach” an image within a drawing. The raster data is not stored in the image - instead, an image entity “points” to the raster file on disk.
Authorize	You must give GTX your HASP ID number to receive the license for full use of your software.
Auto-Convert Threshold	The confidence level above which gTCONVRT will automatically convert a raster character into ACAD text without using the Character Verification Dialog.
AutoSnap™	AutoCAD’s method of dynamically snapping the crosshair to vector objects
Character Verification	The QA process that lets the user verify that ICR correctly creates ACAD text entities, even if it guesses the character wrong.
Confidence Level	A number between 1 and 100 representing the degree to which a character matches those it has already seen.
Contours	Continuous curves that can be represented by the polyline (or pline) vector entities. Typically found on topographical maps.

Term	Definition
Demand Loading	The GTXRaster CAD series executable can “Demand Load” so it doesn't load as soon as AutoCAD starts. Instead, it waits for a GTX command to be issued, and then it loads. Read the GTX manual for instructions on Demand Loading. See your AutoCAD documentation for more information about Demand Loading.
Deskew	To rotate a raster image so that it is no longer skewed.
Despeckle	To remove speckles or small marks that contain no meaningful information from a drawing.
Display Color	The color in which unselected raster is displayed.
DPI	Dots Per Inch -The number of dots per linear inch, calibrating a raster image to real space.
HASP ID	A number built into your HASP key identifying your software license. You can determine this number by running CUSTOMER.EXE.
Highlight Color	The color in which selected raster is displayed.
ICR	Intelligent Character Recognition - Conversion of raster text into ACAD text entities.
Integer	A number evenly divisible by one (1,2,3,4,5 are integers. 1.25, 3/4, and .05 are not integers).
IOP	Intelligent Object Picking™ - The proprietary method by which RCAD series selects raster shapes from a scanned drawing as if they were distinct vector entities.
MemoHASP	Hardware lock that connects directly to the computer running GTXRaster CAD series.
NetHASP	Hardware lock that connects to a NetHASP license manager server. NetHASP keys have more than one license per key.
Object Snapping	ACAD mode of snapping the cursor to a point relative to vector geometry.

Term	Definition
Pixel	Pixels, or “PIcture ELements”, are the tiny dots with which a scanner portrays a drawing.
Polyline Smooth Index	A number representing the smoothness of polylines generated when vectorizing raster contours.
Raster File	Pixel data from a scanned drawing stored as a file. There is a wide range of standards and formats for raster files.
Raster Limits	The area in a raster image in which features can exist; the extents of a raster database.
Raster Snapping	The ability to pick a point relative to raster geometry, such as snapping to the end of a raster “line”.
Rasterize	To convert an AutoCAD vector object into raster format.
REF file	Accompanies a raster file and has the same filename. Stores information about its scale, orientation (loadrotate setting or results of invoking gTURN), units (inch/mm).
Scanner	A device which converts a drawing into raster data by measuring and recording the intensity of light that is reflected from it.
Skewed	Slightly rotated. When a drawing is fed slightly crooked into a scanner, the resulting raster image is skewed.
Transparent Zoom	The ability to change your view of a drawing while in the middle of a command. Type: 'Z, [RETURN]. ACAD starts Zoom command. Old command resumes upon completion.
Vectorize	To convert raster data into vector format, as used in a CAD environment.

Appendix 2: Configuration

The GTXRaster CAD Series receives many of its default values from a configuration file, *GTXRAST.CFG*. This ASCII file can be modified with a text editor such as Notepad. The list below shows the default contents of *GTXRAST.CFG* if you had installed it for using inches. The entries can be listed in any order.

Here is a standard configuration file:

```
REM * GTX Configuration *

REM ** Use “REM” or “rem” for comment lines, blank lines are ok. **
REM **Defines inch or millimeter measurement standard**
DrawingUnits 1Inch=1

REM **Defines the default path for saving raster files.**
RasterPath =CURRENT DIRECTORY

REM **Used with gCreate and color images when gActivated.**
RasterFormat =TIF

REM **Defines the available raster file formats that will be loaded with
an AutoCAD
REM **open when a raster file with the same name is in the same directory.
RasterLoadExt = TIF CG4 G4 G3 C4 GP4 B4 RNL RLC OPT BMP PCX PNG CIT *


REM **Used during gAttach and OPEN only if a GTXRaster CAD .ref file is
present. **
REM **Values for RefRotate:   0,  1, or  2
REM **           0 = Off (no rotation)
REM **           1 = Rotate (rotates Acad entity according to RefAngle)
REM **           2 = Turn  (turns the actual pixels according to RefAngle)
RefRotate=2

REM **Defines angle to rotate or turn a drawing during load (0, 90, 180 or
270 degrees).**
RefAngle=90

REM **The maximum size an image can be created or actived.
REM **Number of pixels = DPI * DPI * ImageHeight * ImageWidth.
REM **This limit (973440000) could create a 400DPI 78” X 78” image.
REM **If set to 0 it's unlimited - warning could exceed memory capacity.
MaxNumPixels=973440000

REM **Defines the marking color for selected raster in editing.  Can use
any color from 0-255.**
```

```
HighlightColor =GREEN

REM **Defines the width of rasterized vector objects.**
RasterWidth =0.01

REM **Yes option creates a backup of the original raster file.**
BackupRas =NO

REM **Yes option saves the vector entity when doing Gburn or Graster.**
SaveVector=NO

REM **Defines the Backup Raster Extension for the BackupRas variable. You
must put a '.' before the extension.**
BackupRasExt=.GTX

REM **Defines the Dot Per Inch resolution within the raster limits.**
REM **Used for gcreate.**
Resolution =200

REM **Set the number of undos that are stored. Not available at this
time**
REM MAXUndo=3

REM **Sets the subformat to be used when saving TIFF files.**
REM Subformat           Value
REM TIFF G3                  1
REM TIFF G4                  2
REM TIFF Uncompressed        3
REM TIFF Tiled V6            4
TiffFormat = 2

REM **Disables a specific command.  Multiple variables can be set but must
be on separate lines.**
REM disable=gattach
REM disable=gload

REM * Text Configuration *
REM **Sets a recognition file for GTXRaster CAD PLUS to automatically load
when it runs.**
REM CharFile =c:\program files\gtx\raster cad V9.1\g_u_0.icr

REM **Sets a character to be listed in the ambiguous characters list box
in the gTConfig dialog.**
REM Ambigchar =I

REM **Sets the initial value for the Orientation list in the gTConfig
dialog.**
CharOrient =0

REM **Sets the initial value of the AutoConvert Threshold setting in the
gTConfig dialog.**
CharThreshold =100

REM **Sets the initial value for the Min Char Size in the gTConfig
dialog.**
```

```
CharMinSize =0.04

REM **Sets the initial value for the Max Char Size in the gTConfig
dialog.**
CharMaxSize =0.4

REM **Sets the initial value for the Space Size setting in the gTConfig
dialog.**
CharSpaceSize =1.0

REM **Sets the initial value for Alignment Offset setting in the gTConfig
dialog.**
CharAlign =0

REM **Sets the initial value for Text Height setting in the gTConfig
dialog.**
TextHeight =0.2

REM **Sets the initial value for Max # Spaces setting in the gTConfig
dialog.**
MaxSpaceSize =1

REM **Sets the initial value for the word-mode verification level.
WordVerifyLevel =100

REM **Sets the initial value for the word-mode force-fit level.
WordForceLevel =0

REM ** 0 means touching character recognition is OFF, 1 means ON
TouchingCR =0

REM ** 0 means word mode CR, 1 means character mode CR
CRMode =1

REM ** Character similarity file for word recognition
REM SimFile = c:\program files\gtx\raster cad plus V9.1\gtxtext.sim

REM ** dictionary file for word recognition
REM WordFile =c:\program files\gtx\raster cad plus V9.1\base.dct
REM WordFile =c:\program files\gtx\raster cad plus V9.1\User.dct

REM ** sets the default GAP JUMP size
REM GAP_SIZE_TO_JUMP = 50

REM ** sets the layer name to be created during hatch recognition
HATCH_LAYER_NAME = HatchLayer

REM ** sets the layer name to be created during linestyle recognition
LINESTYLE_LAYER_NAME = LinestyleLayer

REM * Line Width Configuration *
REM **Defines the rasterized vector width for particular colors.  Can use
any color from 0-255.**
Pcolor 1=0.010
Pcolor 2=0.020
```

```
Pcolor 3=0.030
Pcolor 4=0.040
Pcolor 5=0.050
Pcolor 6=0.060
Pcolor 7=0.070
Pcolor 8=0.080
Pcolor 21=0.090
Pcolor 23=0.100
Pcolor 30=0.110
Pcolor 41=0.120
Pcolor 63=0.130
Pcolor 153=0.140
Pcolor 191=0.150
Pcolor 161=0.160

REM **Set PclrUnit=0 if you want to multiply your pcolor setting by the
AutoCAD scale of the Image.
REM **Set PclrUnit=1 if you do NOT want to multiply your pcolor setting by
the AutoCAD scale of the Image.
PclrUnit=1

REM **Product level. Settings include RCAD, RCADPLUS, RTOOLS, R2V.**
ProductLevel=RCADPLUS
Demomode=NO

REM **If equal to 0, it sets zero-width polylines to be rasterized just as
all other entities.
REM **If set to 1 all plines will be rasterized as 1 pixel wide.**
Zero_Pline=0

REM **Determines the number of minutes of idle time the GTXRaster CAD
series license server
REM **will allow before de-activating an inactive license and making it
available again.**
REM **Value must be at least 60. **
HaspTimeOut=120

REM **Specifies the type of HASP security key being used. Possible
settings include
REM DEFAULT, JAPAN_NEC, JAPAN_IBM.**
Hasp_Type=DEFAULT

REM **Set RefDelLoad=1 if ref file needs to be deleted on doing a gATTACH,
set to 0 otherwise**
RefDelLoad = 0

REM **Set RefMkSave=1 if ref file needs to be created on SAVEASR13 or
SAVEASR12, set to 0 otherwise**
RefMkSave = 1

REM **Images are placed on this layer when attaching.
REM **The current layer is used if no layer name is listed.
DefaultRasterLayer=RASTER

REM ** Defines the layer color for the layer named in the
```

```
REM ** DefaultRasterLayer config parameter.
REM ** Can use any color from 0-255.
RasterColor = RED

REM **Set BkCompMode=1   if ACAD 'Open' and raster saving in R14 should
REM **work similar to R13 and lower versions. Images will be unlinked from
the
REM **parent dwg file and 'ref' files will be created on ACAD Save. Set to
0 for true R14 functionality**
BkCompMode = 0

REM ** Set to 'YES' when another 3rd party application will also be   *
REM ** editing raster images.  This will cause more overhead to keep  *
REM ** keep RCAD in sync with the 3rd party application raster edits. *
REM ** Default is NO.                                                 *
3P_APP_EDIT=NO

REM ** When set to 'YES', RCAD will not perform transparent saving ofREM
** edited raster images.
REM ** Useful when another 3rd party application will also be
performingREM ** transparent saving.
REM ** Default is NO.
3P_APP_SAVING=NO

REM **
REM ** A raster image attached with the 'gattach' command willREM **
automatically be the active image (gactive) when the parameter
REM ** is set to YES.
REM ** Default is YES.
GACTIVE_ON_GATTACH=YES

REM **Allows saving raster files over Novell 4.x
ENABLE_NOVELL_SAVING=YES

REM **Allows saving raster files over Novell 3.x
NOVELL3_SAVE_METHOD =No

REM ** Keep the following setting at 'YES' to prevent
REM ** holes from forming in the warped image
WARP_CORNER_PTS=YES
```

Customizing

The GTXRaster CAD Series uses AutoCAD profiles to determine the location of program files. You can create multiple versions of *GTXRAST.CFG* and have an AutoCAD profile for each one. Looking at the properties of the GTXRaster CAD Series icon you will see:

```
"C:\Program Files\ACAD2006\acad.exe"  /p GTX
```

The standard GTX profile is called “GTX”. Use AutoCAD’s **Options** command to create copies of the GTX profile, modifying the paths and filenames as required. The GTXRaster CAD Series will use the first configuration file it encounters.

When AutoCAD is invoked, the *GTXRAST.CFG* file is checked. If the program does not recognize an entry (for example, RsterForm=) or if a value is invalid, you will get an error message. Any invalid entry is ignored and the program’s default value is used instead.

Configuration Entry Descriptions

The configuration file entries are explained below and valid entries are given. Any items not included in the file or not given a value will use the default values.

Basic Configuration Parameters

DrawingUnits This entry has two functions. It defines whether configuration values should be inches or millimeters and also how the World Coordinate Units should be applied to the raster image. The raster image can be either “1inch” or “1mm”; the other linear measurements in the configuration file will be in the same unit (i.e., if you specify “mm” the RasterWidth parameter will express millimeters and the value should be adjusted accordingly). The DrawingUnits value defines what inch or 1 mm on the raster image maps to in AutoCAD units. The value entered must be a real number. This defaults to AutoCAD’s initial units value.

RasterPath Defines the default path for saving raster files. You can override the directory entered here by entering the full path when prompted for a file name. The default is to save the file in the current directory.

RasterFormat Defines the default storage format of new raster files. This is used by **gCREATE** and when using **gACTIVE** on color images.

RasterLoadExt Defines the available raster formats that will be loaded with AutoCAD open when a raster file with the same name is in the same directory.

RefRotate Defines the angle to rotate images with accompanying .REF files when attached with **gATTACH** (whether explitly invoked or incidentally invoked using AutoCAD **OPEN** command). Valid entries are **Rotate**, **Turn** or **Off**.

Rotate: Performs an AutoCAD **ROTATE** on the image entity, then moves the image so the new lower left corner is located where the old one was. Use this option if you want to migrate hybrid raster data back to older versions of GTX software. The disadvantage is that raster files with .REF files are attached at an angle. **No raster data is changed - the image is rotated and moved!**

Turn: Performs a **gTURN** on the image entity, which actually rotates the raster data and **swaps** the X and Y raster limits, resizing the image. Use this option if backward migration to earlier GTX software is not important. The advantage of this option is that images are attached at a 0° orientation.

RefAngle Defines the angle used by **RefRotate** parameter. Valid entries are 0, 90, 180, 270 degrees. The default is 90.

MaxNumPixels Sets the maximum number of pixels allowed in a new raster image. Default setting is 973,440,000, which at 400 dpi is equivalent to 78 x 78 inches or 1990 x 1990 millimeters.

HighlightColor Defines the default color used to highlight selected raster data. Choose a color that can be seen against the raster image and against the background color. Valid entries are the same for RasterColor. The color can be changed with the **gCOLOR** or **gLAYER** commands. The default is **GREEN**.

RasterWidth Sets the default raster line width to be used when vector entities are converted to raster. The entry should be an appropriate real number, or **T** if you want to specify the Line Width Table values. The default is **.01**. This value will be in inches or mm according to the **DrawingUnits** entry. All the values can be reset when you use the **gRASTER** command.

BackupRas “Yes” causes raster save to create a backup raster file. “No” deactivates the backup option.

BackupRasExt Sets the file extension for backup raster files.

Resolution Defines the default **resolution** for new raster images.

MaxUndo Sets the number of raster undos that are stored.

Tiffformat Sets the subformat to be used when saving TIFF files:

TIFF G3 1

GIFF G4 2

TIFF UNCOMPRESSED 3

TIFF TILED V6 4

Disable Disables a specified command. Enter a single command name (i.e., **gMOVE**) after the word “Disable”. The software will not allow the user to invoke the specified command. To disable multiple commands, add more *Disable [Command Name]* lines to the configuration file.

Text Configuration Parameters

CharFile sets a recognition file for **GTXRaster CAD** *PLUS* to automatically load when it is run. If you want the program to load multiple recognition files, add more *CharFile [Recognition File]* lines to the configuration file.

AmbigChar sets a character to be listed in the ambiguous characters list box in the gTCONFIG dialog upon starting **GTXRaster CAD** *PLUS*.

CharOrient sets the initial values for the **Orientation** list in the **gTCONFIG** dialog, determining the allowed orientations for building AutoCAD text entities. The default setting is **0**. Valid entries are any angle between -360 and 360 degrees.

CharThreshold sets the initial value of the **AutoConvert Threshold** setting in the **gTCONFIG** dialog. This is the character **confidence level** above which the character verification dialog appears. The default value is **100**, which makes the character verification dialog appear every time. Valid entries are integers from 0 to 100.

CharMinSize sets the initial value for the **Min Char Size** setting in the **gTCONFIG** dialog, determining the minimum value for raster text characters when using Text IOP or **gTCONVRT**. The default value is **.04**.

CharMaxSize sets the initial value for the **Max Char Size** setting in the **gTCONFIG** dialog, determining the maximum value for the raster characters when using Text IOP or **gTCONVRT**. The default value is **.4**.

CharSpaceSize sets the initial value for the **Space Size** setting in the **gTCONFIG** dialog, defining the distance between raster characters in terms of a typical character's width necessary for **gTCONVRT** to insert a space character. The default value is **1.0**. Valid entries are any positive real number.

CharAlign sets the initial value for the **Alignment Offset** setting in the **gTCONFIG** dialog, determining the minimum vertical distance, relative to the text strings' orientations, between separate lines of text in terms of a percentage of a typical character's height. The default setting is **0**. Valid entries are any real number.

TextHeight sets the initial value for the TextHeight value in the text configuration dialog.

MaxSpaceSize sets the initial value for the **Max # Spaces** setting in the **gTCONFIG** dialog, determining the maximum number of spaces that can be inserted into a text string by **gTCONVRT** before it breaks the text string into two separate AutoCAD text entities. The default setting is **1**. Valid entries are integers 1 through 100.

MaxSpaceSize sets the initial value for the **Max Space Size** dialog.

WordVerifyLevel Sets the initial value for the word-mode verification level.

WordForceLevel sets the initial value for the word-mode force-fit level.

TouchingCR controls whether ICR splits touching characters. 0 means OFF, 1 means ON

CRMode controls whether ICR is performing *Character* recognition or *Word* recognition. 0 means word mode CR, 1 means character mode CR

SimFile establishes the character similarity file to use for word recognition. *Gtxtext.sim* is hardcoded into GTX, but if another file is loaded it will override the default similarity settings.

WordFile establishes the dictionary file(s) to load on startup.

Raster-to-Vector Conversion Parameters

GAP_SIZE_TO_JUMP sets the default GAP JUMP size.
HATCH_LAYER_NAME sets the layer name to be created during hatch recognition.
LINESTYLE_LAYER_NAME sets the layer name to be created during linestyle recognition

PColor Establishes a value in the line width configuration table.

Pcolor [Color Value]=0.050 [Line Width]

PClrUnit Determines behavior of linewidth color table when rasterizing or vectorizing with a scaled image. Set PclrUnit=0 if you want to multiply your pcolor setting by the AutoCAD scale of the Image. Set PclrUnit=1 if you do NOT want to multiply your pcolor setting by the AutoCAD scale of the image.

Other Parameters

ProductLevel sets the product level for the GTXRaster CAD series to run. Settings include RCAD, RCADPLUS, RTOOLS, R2V.

DemoMode Determines whether GTXRaster CAD operates in demonstration mode. Although GTXRaster CAD will revert to demo mode if a HASP key is not present, this process can take up to a few minutes. If you install GTXRaster CAD specifically for demonstration purposes, **DemoMode=YES** causes it to automatically enter demonstration mode without this delay. **DemoMode=NO** (default setting) causes GTXRaster CAD to look for the HASP key when it first runs.

Zero_Pline Determines how polylines of zero width are rasterized. 0 causes zero-width plines to rasterized like other entities. 1 causes them to rasterize at 1 pixel wide.

HaspTimeOut Determines the number of minutes idle time the GTXRaster CAD Series license server will allow before de-activating an active license and making it available again. Must be at least 120.

Hasp_Type Specifies the type of HASP security key being used. Available settings are: **Default**, **Japan_IBM** and **Japan_NEC**.

RefDelLoad Specifies the behavior of gATTACH as it loads a raster file with an associated .REF file. If set to 1, the .REF is deleted. If set to 0, the .REF file is kept.

RefMkSave Specifies whether a .REF file is created for each attached image when AutoCAD **SAVEASR12** and **SAVEASR13** commands are invoked.

DefaultRasterLayer establishes the name of a layer on which images are placed when attached using **gATTACH**.

RasterColor defines the layer color for the layer named in the DefaultRasterLayer config parameter. Any color from 0-255 can be used.

BkCompMode When set to 1, this overrides AutoCAD's normal behavior to make it behave more like earlier versions of the GTXRaster CAD Series. When a drawing containing attached images is opened, any image that does not have the same name as the drawing is detatched, deleting its image entities. Any raster file with the same name as the drawing will then be attached using any .REF files to register the raster in the vector drawing.

3P_APP_EDIT should be set to **Yes** when another 3rd party application will also be editing raster images. This will cause more overhead to keep RCAD in sync with the 3rd party application raster edits. When set to 'YES', RCAD will not perform transparent saving of edited raster images.

3P_APP_SAVING is used when another 3rd party application will also be performing transparent saving.

GACTIVE_ON_GATTACH controls whether a raster image attached with the **gATTACH** command should automatically become active (**gACTIVE**).

ENABLE_NOVELL_SAVING allows saving raster files over Novell 4.x

NOVELL3_SAVE_METHOD allows saving raster files over Novell 3.x

Line Width Configuration

The line width configuration table is important to several functions of the GTXRaster CAD Series. Because AutoCAD vector entities have no line width, the GTXRaster CAD Series lets you assign raster line widths to AutoCAD vector colors.

When converting raster to vector, **gCONVRT** can assign different colors to vectors resulting from different raster line widths. The **gRASTER** command converts vector data to raster. When rasterizing, AutoCAD vector entities of different colors can be rasterized to different line widths. When smoothing raster the **gSMOOTH** command can snap raster data to the closest line width listed in this table.

The format for listing a color/linewidth listing is:

```
Pcolor Color# = LineWidth
```

in which **Color#** is the AutoCAD color number to be associated with the raster linewidth. **LineWidth** is the width of the raster line (this can be measured using the AutoCAD **Dist** command).

Appendix 3: Raster File Formats

AutoCAD allows you to attach images in a limited number of formats:

Type	Description and versions	File extension
BMP	Windows and OS/2 bitmap format	.bmp, .dib, .rle
CALS-I	Mil-R-Raster I	.gp4, .mil, .rst, .cg4, .cal
GIF	CompuServe Graphics Exchange Format	.gif
JFIF		.jpg
FLIC	Animator FLIC	.flc, .fli
PCX		.pcx
PICT		.pct
PNG		.png
TARGA		.tga
TIF/LZW		.tif

AutoCAD does not let you **save** images - the GTXRaster CAD Series lets you do so. The available formats are shown on the next page.

The following table shows the read and write raster formats which GTXRaster CAD Series adds to AutoCAD's native abilities. The table also covers the Rastrans utility read/write formats:

Raster Format	Ext.	Read	Write
Adobe PostScript	ps	-	-
Boeing Bedmics	B4	X	X
GTX Uncompressed Runlength	rnl	X	X
CalComp Raster Format	crf	-	-
CCITT G3-GTX Header	g3	X	X
CCITT G4-GTX Header	g4	X	X
CImage Corp.	dsi	X	
EDMICS Tiled G4	c4	X	X
Formtek img	Img	X	
JEDMICS			
FileNET G4 Tiled	img	X	X
FileNET G3 Tiled	img	X	
FileNET G4 Banded	img	X	

Raster Format	Ext.	Read	Write
FileNET G3 Banded	img	X	
GraphTEC RLC	rlc		X
HP Deskscan	tif	X	X
HP Printer Control Language	pcl	-	-
HP Raster Transfer Language	rtl	-	-
PC Paint format	pcx	X	X
Image Systems Runlength	rlc	X	
Image Systems Runlength 2	rlc		X
Japan Digital Labs 4000E	jd4	-	-
Japan Digital Labs	jdl	-	-
CCITT G3-TIFF	tif	X	X
CCITT G4-TIFF	tif	X	X
Cals G4 - (MIL-STD-28002A) (28002 Type I supported. 28002 Type II not supported)	cg4	X	X
Oce Graphics/NKK (Japan)	oce	-	-
Optigraphics TIFF	opt	-	-
Raster Graphics	rle	-	-
TIFF Uncompressed	tif	X	X
TIFF Version 6 Tiled	tif	X	X
TIFF Packbits	tif	X	
Versatec Block Format	vbf	-	-
Versatec VDS	vds	-	-
Fuji/Xerox MMR	mmr	X	X
Intergraph	cit	X	X

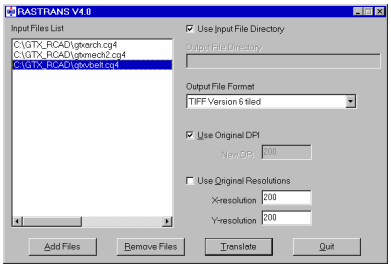
Note: ***The PCX file writer provided by AutoCAD does not facilitate the saving of the resolution of the file. Files of this type are loaded without a resolution and the gINFO command cannot report a resolution. The GTXRaster CAD Series software can save a PCX file into any of the other GTX supported file formats with a resolution of 200 dpi. When saved to another format, the file will always have a default resolution of 200 dpi.***

Rastrans Raster Format Translator V5.0

The Raster Format Translator (*RASTRANS*) is a stand-alone utility included with the GTXRaster CAD Series the same input/output formats as GTXRaster CAD. Rastrans translates raster files from one raster format to another. It can scale translated files separately in the X and Y axes. GTXRaster CAD series includes both Windows and DOS versions of GTX Rastrans. The DOS version lets you create DOS batch scripts.

Windows GUI Version

The Windows version of GTX Rastrans is the executable, *Rastrans.exe*, located in the GTX directory.



RASTRANS MAIN SCREEN

Upon running Rastrans, the main screen will appear.

The left side of the Rastrans main screen contains the **Input Files List,** showing all the raster files to be translated.

INPUT FILES LIST

This list box displays the files to be batch-translated to the selected output file format.

ADD FILES

Select to add raster files to the Input Files List.

Select any or all files to be translated into the Output File Format. Multiple files can be selected by holding **[Shift]** or **[Control]** while using the left mouse button to pick more than one file at a time.

REMOVE FILES

Removes files from the Input Files List.

ABOUT RASTRANS

Displays copyright information.

OUTPUT FILE DIRECTORY

Specifies output directory for translated files. Selecting **Use Input File Directory** sends output to the same directory as the source files.

OUTPUT FILE FORMAT

Displays the file format to which input files are to be translated. Selecting **Print to [Your Printer]** sends the output directly to the current Windows system printer. Scale may need to be adjusted to fit a drawing.

DPI

Use Original DPI sets resulting raster output at the same **DPI** as the input file. **New DPI** specifies an override dpi for output files.

RESOLUTION

Use Original Resolution sets resulting raster output at the same **Resolution** as the input file. **New DPI** specifies an override resolution for output files.

TRANSLATE

Begins translating input files into files of the output file format in the specified output directory.

QUIT

Exits Rastrans.

RESTART

After translating, the **Translate** button is renamed **Restart**. Clears the Input Files List, allowing you to do another batch conversion if desired.

RASTRANS.PDF

For additional documentation, refer to *Rastrans.pdf* located in the GTX directory.

DOS Version of GTX Rastrans

GTXRastrans is also available as a DOS application.

USAGE:

```
Rastrans infilename {outfilename|lpt1|lpt2|lpt3} [-rof
{calsg4|gtxg3|gtxg4|tiffg4|tiffg3|tiffu|tiled|rnl|rlc|jd
l|crf|rtl|pcl|vbf|ps|opt|pcx|rle|nkk|grphtec|hpg}] [-dpi
input resolution]
```

Argument	Description
Infilename	raster input filename Input file types are autodetected independent of file extension (except b4, c4, rlc) Input file types recognized are gtxrnl, gtxg3, gtxg4, calsg4, tiffg3, tiffg4, tiff packbit, tiff uncompressed, tiled tiff, rlc, rlc2, dsig4, pcx, filenet img, b4, c4, cit
Outfilename	the raster output filename
-rof	optional – specifies the output file format type
-dpi	optional – input resolution (50 to 10000)
-xdpi	optional - output x resolution (50 to 10000)
-ydpi	optional - output y resolution (50 to 10000)
-odpi	optional - output x and y resolution (50 to 10000)
-rot	optional - rotation of 90, 180, or 270

Appendix 4: GTX OSR V5.0

GTX OSR (Open Systems Recognition) V5.0, a stand-alone batch conversion program, is included as part of the GTXRaster CAD *PLUS* and GTXRaster R2V products. GTX OSR builds a list of raster images and converts them into vector DXF, IGES or CGM files.

GTX OSR installs along with the GTXRaster CAD series and runs on the same license. No additional installation, configuration or license authorization is required.

System Requirements

GTX OSR requires the following configuration:

CPU	Pentium II or better
Operating System	Windows 98 SE, NT 4.0, 2000, XP
Drive space	4 MB free hard disk space
Virtual memory	100 MB swap file
Memory	64 MB RAM

Using GTX OSR

GTX OSR reads a list of raster files and converts the raster data to vector data. This "raster-to-vector" conversion occurs in a batch process, yet the parameters for each drawing can be set independently.

Conversion Process

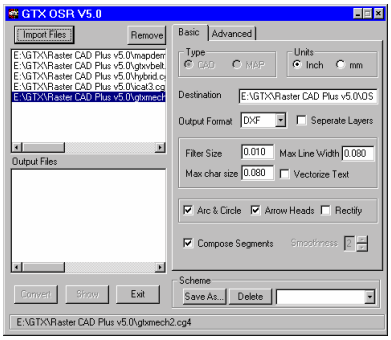
Your original paper drawings need to be scanned, producing a raster file. GTX OSR performs best on a raster image without speckles. The GTXRaster CAD series can be used to clean up the raster images before running them through GTX OSR.

Note: Contact your GTX sales representative for additional information on compatible scanning and raster editing products.

The conversion process begins by compiling a list of raster files by using the Open dialog. Setting the parameters before importing images establishes a global configuration. Setting the parameters after importing images configures each image independently. The conversion process begins and GTX OSR begins creating the vector conversion file of the scanned drawings.

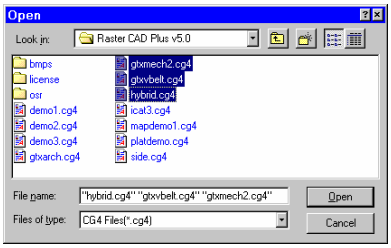
When GTX OSR is finished converting the raster files, you will see a list of Output Files that can be imported by other viewing and/or editing software.

Main Screen Layout



The left half of the Batch Command Center displays the input and output files. The right half controls the parameters of each raster file's conversion. The **Convert** button begins conversion once the Import Files list is completed. An advanced pane allows detailed configuration of conversion results.

IMPORT FILES



The Import Files window displays the raster files to be converted. Click on the Import Files button in the upper-left corner of the main screen to specify the raster files to convert. A file dialog will open:

Select the file or files to be converted. Use the shift and control keys to select multiple files. In the main screen you can remove any raster file from the list with the **Remove** button. You can also import additional files. GTX OSR may be minimized while it is converting files.

The **Halt** button will pause the conversion process. GTX OSR then prompts as to whether it should resume the conversion process. **No** cancels the operation, retaining the original selection of imported files. Jobs that have already been processed prior to selecting **Halt** will be saved.

Note: ***It can be helpful if you create your own directories for raster images, especially if you are using a raster format other than TIFF, G4, or CG4. The List Files of Type field in the Import Files dialog assigns the filter to the listed files – GTX OSR internally recognizes the actual format of a raster file regardless of the file's suffix. List files of type *.* to see .PCX files.***

Raster File Formats

GTX OSR uses most of the same raster formats as GTXRaster CAD. Formats exclusive to AutoCAD are not available.

Raster Format	Ext.	Read	Write
Boeing Bedmics	B4	X	X
GTX Uncompressed Runlength	rnl	X	X
CCITT G3-GTX Header	g3	X	X
CCITT G4-GTX Header	g4	X	X
CImage Corp.	dsi	X	
JEDMICS Tiled G4	c4	X	X
FileNET G4 Tiled	img	X	X
FileNET G3 Tiled	img	X	
FileNET G4 Banded	img	X	
FileNET G3 Banded	img	X	
GraphTEC RLC	rlc		X
HP Deskscan	tif	X	X
PC Paint format	pcx	X	X
Image Systems Runlength	rlc	X	
Image Systems Runlength 2	rlc		X
CCITT G3-TIFF	tif	X	X
CCITT G4-TIFF	tif	X	X
Cals G4 - (MIL-STD-28002A) (28002 Type I supported. 28002 Type II not supported)	cg4	X	X
TIFF Uncompressed	tif	X	X
TIFF Version 6 Tiled	tif	X	X
TIFF Packbits	tif	X	
Fuji/Xerox MMR	mmr	X	X
Intergraph	cit	X	X

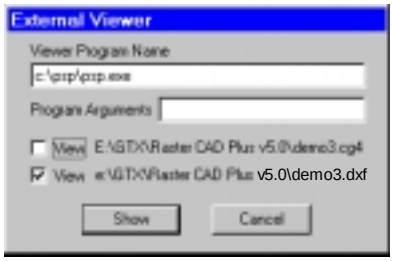
Output Files

The Output Files window displays conversion results. To select a file, click its name. To display the vector output, select the output file to display and click on the Show button. The Show button may need to be configured to work with a specific viewer.

CONVERT

The **Convert** button launches the conversion process using the parameter settings on the right half of the main screen. After a conversion is complete, the label on the **Convert** button changes to **Restart**. This clears the input and output lists, allowing another conversion session to begin.

SHOW



The **Show** button can launch an external viewer to display conversion results.

Highlight the desired filename

Select **Show**

The External Viewer dialog appears:

Specify the external viewer's executable filename.

Specify any command-line arguments required by the viewer.

Select the raster file, vector file or both files.

Select **Show**.

EXIT

The **Exit** button closes GTX OSR. During conversion, this is labeled, "**Halt"**. This button prompts to continue processing the job or to exit. Uncompleted conversions will be lost.

SCHEME

Save As button opens a dialog that lets you name a scheme in which all configuration settings are saved.

Delete removes the selected scheme and is useful in maintaining a list of only the desired schemes.

Basic Pane

The Basic and Advanced pane settings are controlled on the right side of the main screen. These panes determine which output format is used and how to represent text, line widths, arrowheads and contours in the final vector file.

TYPE

Type can be set to CAD or Map.

CAD mode converts raster data into vector lines, arcs and circles. It is effective for mechanical drawings and line diagrams.

MAP mode converts raster data into vector polylines and is more effective for mapping applications and other drawings in which the preservation of contours is important.

UNITS

Units can be set to Inches or Millimeters.

This unit applies to the **Filter Size**, **Max Line Width** and **Max Char Size** settings.

Note ***Because GTX OSR uses inches internally, choosing millimeters will use millimeters as the vector file's units and also scale the output by 25.4.***

DESTINATION

The **Destination** directory is the location where converted files are written. This field defaults to the current directory.

OUTPUT FORMAT

The **Output Format** determine the vector file format. Choices include DXF, IGES, CGM or MTF.

DXF Autodesk Drawing eXchange Format

IGES

CGM Computer Graphics Metafile

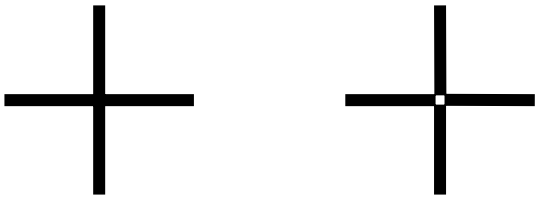
MTF GTX Metafile

SEPARATE LAYERS

Because DXF files have no linewidth for lines, arcs and circles, there needs to be some way of preserving that information. Checking **Separate Layers** separates DXF file output onto different layers by raster linewidth. Otherwise, all vectors are placed on the same layer.

COMPOSE SEGMENTS

Compose Segments controls whether intersecting elements are continued across or broken at intersections.



On the left, intersecting lines are shown with Compose Segments enabled. On the right, the same lines with Compose Segments disabled are shown.

FILTER SIZE

GTX OSR only converts raster elements above a certain size. The Filter Size specifies the maximum size for objects omitted during conversion. Any object exceeding this length in any direction will be retained; any object equal or smaller will be discarded. The entry must be a positive real number in the range of 0 to 2 inches (or 0 to 50.8 mm).

Note: ***The Filter Size serves as the filter only if OSR is set to Vectorize Text. Otherwise, the Maximum Character Size limits the size of the smallest converted raster elements.***

MAXIMUM LINE WIDTH

Raster areas wider than the Maximum Line Width are recognized as filled polygons or solids. This must be a positive real number between 0 and 2 inches (or 0 to 50.8 mm).

MAXIMUM CHARACTER SIZE

Any raster elements larger than the Maximum Character Size is converted as normal geometry. Any elements between the Filter Size and the Maximum Character Size are considered text, even if they are geometric dashes (dashed lines) or other small text-sized geometry. Whether they appear in the converted file depends on the Vectorize Text setting.

VECTORIZE TEXT

Text-sized raster elements between the Filter Size and the Maximum Character Size are converted and placed on a text layer when this is active. Text-sized elements are omitted from the output file when this is inactive. If a piece of raster is between these sizes but is not actually text, it is still treated as text.

ARC & CIRCLE

Arc & Circle is available under CAD mode only and determines whether arcs and circles are output. If inactive, arcs and circles will be interpreted and output as lines.

ARROW HEADS

Arrow Heads is available under CAD mode only and determines whether arrowheads (3-sided solids) are output. If inactive, arrowheads are dropped from the output.

RECTIFY

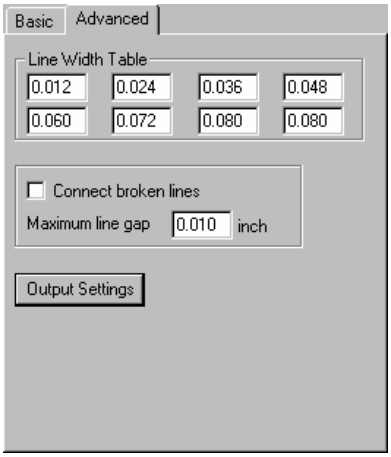
Rectify is available under CAD mode only and corrects the angle of output vector data. Lines that are close to orthogonal (0 or 90 degrees) will be snapped to 0 and 90 degrees. When disabled, lines remain at their original orientations.

SMOOTHNESS

Smoothness is available under MAP mode only and specifies how close together polyline vertices are drawn. The smoothest value is 1 and the least smooth value is 9.

Advanced Pane

The Advanced Pane configures detailed conversion settings. These settings determine line width, maximum line gap jump and output settings.



Line Width Table

This table specifies up to eight widths for recognized lines. All entities having line width attributes are snapped to the nearest setting in the table. The entries must range from smallest to largest and be positive real numbers between 0 and 2 inches (or 0 and 50.8 mm).

CONNECT BROKEN LINES

This spans gaps in broken lines, including dashed lines. When active, lines with gaps smaller than the Maximum Line Gap are merged into single lines. When inactive, lines with gaps, including dashed lines, generate individual lines.

MAXIMUM LINE GAP

When Connect Broken Lines is active, lines with gaps smaller than the Maximum Line Gap are merged into single continuous lines.

OUTPUT SETTINGS

The Output Format Settings dialog has three panes: DXF, CGM, and IGES.

DXF SETTINGS

Hollow Polygons

When active, Hollow Polygons causes AutoCAD “Solid” entities (such as arrowheads) to be displayed as hollow. When inactive, this causes solids to be solid.

Line Widths

When active, Line Widths specifies that conversion should retain line widths. Inactive Line Widths setting indicates that all lines will translate with zero width. When this is active, GTX OSR also translates lines, arcs and circles as polylines with width.

Scale

Specifies the scale factor (positive real number) used to multiple both X and Y dimensions.

CGM SETTINGS

Coordinate

Integer or Real values

Precision

Specifies the word size in bits. If Coordinate is set to Integer, valid entries are 16 or 32. If Coordinate is set to Real, valid values are 32 or 64.

IGES SETTINGS

System ID

Sets the system id value for IGES output.

Hollow polygons

When active, filled polygons translate into closed polygons. When inactive, they translate into closed areas with fill property.

Filled circle flash

When active, filled circles translate into flash entities. When inactive, they translate into circles with fill property.

Filled circle circle

When active, filled circles translate into circles. When inactive, they translate into circles with fill property.

Default delimiters

When active, default delimiters (“,” and “;”) are output in string format “IH,” and “IH;” in the global section of IGES files. When inactive, delimiters are ignored.

Units

Units can be set to Inch or Millimeters. Specifies units of measurement for parameters.

CALS Class

CALS Class specifies what CALS compliance is required by IGES files.

Record Length

Record lengths are 80 or 82. If set to 82, CR and LF are appended to each record.

Vector Entity Translation

The GTX OSR conversion process creates different entities depending on the capacity of the final output format.

Basic Shape	IGES Entity	CGM Entity	DXF Entity	
			No Width	Width
Line	Line	Line	Line	Polyline
Arc	Arc	Circular Arc Center	Arc	Polyarc
Circle	Circle	Circle with hollow interior	Circle	Donut

Basic Shape	IGES Entity	CGM Entity	DXF Entity	
Filled Circle	Circle with property or flash entity without fill property	Circle with solid interior	polyline with width	polyline with width
Filled Polygon	Closed polyline (linear path) with or without fill property	Polygon with fill “solid” or polygon set with fill “solid”	solid polygon or polyline with no width	solid polygon or polyline with width
Text Object	Lines on TEXT layer	Polyline	Lines on TEXT layer	Lines on TEXT layer
Layer	Layer	Begin Picture	Layer	Layer

Command Line Version of OSR

GTX OSR is accompanied by a DOS/command-line version. Running **osrc.exe** from the command line without arguments will display usage notes on the screen and also generate an empty **OSR.ERR** error file log in the same directory (if not present).

Running OSR with only an input and output file specified will cause the program to produce a configuration file. This file can then be customized using a normal text editor and specified as the desired configuration file for further OSR conversions. Different configuration files will be produced based on the type of output file specified.

Process Flow

The raster-to-vector conversion consists of the following steps:

1. Read raster input file

2. Convert to GTX metafile format

3. Translate to indicated vector format

4. Write vector output file

The parameters used for the conversion from raster to GTX metafile are defined in the OSR.CFG configuration file. The parameters are contained in the OSRMAP.CFG file for GTX OSR Contours. An appropriate configuration file also defines the translation from GTX MTF format to another vector format.

The command-line entry must include the names of the input file and the output file. You can include paths if you want to override the settings for the input and output paths specified in the OSR.CFG configuration file. You may create several different configuration files with different settings and names. You can specify which OSR configuration file to use by means of the '-cfg' option.

Except for RLC input files, file names can have any extensions. The program can read the file header to determine the raster format. If the output file name does not have an extension that indicates the format, the -vof (vector output format) option must be used, followed by the letters that indicate the vector format.

Configuration Files

Configuration files are used with this program to customize and streamline the processing. The files can be edited with a text editor. The entry names and settings are not case sensitive. The separator between the name and '=' is not space and tab sensitive. The separator between "=" and the setting is also not space and tab sensitive. <CR> is the delimiter of each character string. If an entry is eliminated or the setting is blank or not valid, you will get an error message and the default setting will be used.

The configuration file(s) used for a translation or conversion must be accessible for the program to operate. The program will first search the current directory, then the home directory. For conversion, the program will also check for the specific vector configuration file in the directory specified in the VectorPath of the OSR.CFG file.

If a needed configuration file cannot be found, the Program will create one with the original default settings in the current working directory and allow the user to accept or reject this substitution. The command is cancelled if the user does not want to use the program's default settings. If the needed configuration files are available but have invalid entries, the user will be prompted that OSR is using the default settings for these and the command is carried out.

THE OSR.CFG FILE

The configuration files for GTX OSR contain information used by the program during the conversion process such as the units used for measurement, input and output file formats and storage locations, and conversion parameters and filter tolerances.

The following tables list the information maintained in the configuration files. The values shown are the program's default values.

OSR.CFG

Default OSR.CFG File Contents	
Variable	Default Value
RasterPath	=./
VectorPath	=./
Units	=inch
FilterSize	=. 01
ArcCircle	=yes
Arrowheads	=yes
ComposeSegments	=yes
Layering	=compress
LineWidth	=.08
LineWidthTable	=.012, .025, .036, .050
Text	=classify
TextSize	=.08
TextWidth	=.01
TextString	=Yes

THE OSRMAP.CFG FILE

Default OSRMAP.CFG File Contents	
Variable	Default Value
RasterPath	=./
VectorPath	=./
Units	=inch
FilterSize	=.01
Smoothing	=2
ComposeSegments	=yes
Layering	=compress
LineWidthMax	=.08
LineWidthTable	=.012, .025, .036, .050
Text	=classify
TextSize	=.08
TextWidth	=.01
TextString	=yes

A brief description of the entries in the OSR.CFG and OSRMAP.CFG files follows. Entries specific to each are noted.

RasterPath: Specifies the default location for raster input files. Entry can be any valid path. The default is the current directory.

VectorPath: Specifies the default location for vector output files. Entry can be any valid path. The default is the current directory.

Units: Specifies the unit (inch or millimeter) used for the FilterSize, LineWidth, TextSize, and TextWidth parameters. Acceptable entries are **INCH** and **MM**.

FilterSize: Specifies the maximum size for objects to be deleted during raster-to-vector conversion. Any object exceeding this length in any dimension will be retained; any object equal to or smaller will be discarded. The entry must be a positive real number, in the range of 0 to 2 inches (or 0 to 50.8 mm).

ArcCircle: (GTX OSR CAD Only) Specifies whether the system will perform arc/circle recognition. **NO** means convert arcs and circles as lines, not arc/circle entities. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

Arrowheads: (GTX OSR CAD Only) Specifies whether filled polygons with three vertices should be recognized as arrowheads. **YES** indicates arrowheads will be recognized as arrowheads; **NO** indicates that such polygons will be recognized just as polygons. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

Smoothing: (GTX OSR Contours Only) Specifies how tightly the small deviations in the lines are followed. Valid entries are 1, 2, or 3. Option I follows the lines the most accurately. Option 3 provides a smoother, less jagged line. Option 2, the default, is a balance between the two.

ComposeSegments: Specifics how a line that intersects with another object will be processed during raster-to-vector conversion. If set to **YES**, the segments on either side of the intersection will be combined into one line; **NO** indicates that each segment will be a separate line. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

Layering: Specifies whether only layers with geometry should be kept (**COMPRESS**) or whether the number of layers shown should be kept constant (**FILL**). Acceptable entries are **COMPRESS** and **FILL**.

LineWidth: Specifies the maximum width for an entity to be recognized as a line. Lines wider than the maximum will be recognized as filled polygons. The entry must be a positive real number, in the range of 0 to 2 inches (or 0 to 50.8 mm)

LineWidthTable: Specifies up to eight widths for recognized lines. All entities having line width attributes are snapped to the nearest setting in the table. The entries must go from the smallest to the largest. The entries must be positive real numbers, separated by commas, in the range of 0 to 2 inches (or 0 to 50.8 mm).

Text: Specifies whether data classified as text should be discarded (**DISCARD**) or vectorized (**CLASSIFY**). When set to **CLASSIFY**, the data will appear as UTEXT in GTX Metafiles; will be vectorized as lines on a TEXT layer for DXF and IGES, and vectorized as lines on the drawing image for CGM. Acceptable entries are **DISCARD** and **CLASSIFY**.

TextSize: Specifies the maximum height or width for data to be considered text. Data equal to or below this size but larger than the filter size is classified as text.

TextWidth: Specifies the text width for vectorized text. This only affects DXF, IGES, and CGM output.

TextString: Specifies whether a group of text characters will be formed as a string. This only affects MTF output. If set to **YES**, each group will be considered a string; **NO** indicates that each character will be vectorized as a single character entity. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

THE IGES.CFG FILE

The IGES.CFG file is used to customize the way entities are translated so they will fit the parameters of your particular version of IGES. The following shows the default contents of the IGES.CFG file.

Default IGES.CFG File Contents	
Variable	Default Value
Units	=inch
SystemID	=cad
OutlinePoly	=no
FilledCircle_flash	=no
FilledCircle_circle	=no
DefaultDelimiters	=no
RecordLength	=80
CALSClass	=2

The entries are explained below:

Units: Specifies the unit of measurement for parameters. Acceptable entries are **INCH** or **MM**.

SystemID: The name or identifier of the receiving program. This identifier is for operator identification only and has no bearing on the file conversion. It can be a character string of up to 10 characters.

OutlinePoly: **YES** specifies that filled polygons will be converted as closed polylines. **NO** specifies that they will be converted into closed areas with fill property. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

FilledCircle_flash: **YES** specifies that filled circles will be converted to flash entities. **NO** specifies that they will be converted to circles with fill property. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

FilledCircle_circle: **YES** specifies that filled circles will be converted to circles. **NO** specifies that they will be converted to circles with fill property. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

DefaultDelimiters: **YES** indicates that default delimiters (,;) should be output in string format 'IH' and 'IH;' in the global section of the IGES file. **NO** indicates that the delimiters should be ignored. Acceptable entries are **YES** (**Y**), **NO** (**N**).

RecordLength: Acceptable entries are **80**, **82**. If the setting is **82**, <CR> and <LF> (line feed) are appended to each record.

CALSClass: Specifies what CALS compliance is required. Acceptable entries are **0**, **1**, and **2**. A "**0**" setting indicates that CALS compliance is not required.

THE DXF.CFG FILE

The confirmation file for conversion to AutoCAD's DXF format has only three entries:

Default DXF.CFG File Contents	
Variable	Default Value
OutlinePoly	= no
Scale	=1.0
Widths	= no

The terms are explained below.

OutLinePoly: **YES** specifies that filled polygons will be converted as closed polylines. **NO** specifies that they will be converted into closed areas with fill property. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

Scale: Specifies the scale factor used to multiply both X and Y dimensions. It must be a positive real number.

Widths: **YES** specifies that the conversion should retain the line widths. **NO** indicates that all lines will translate with a width attribute of 0. When this is set to **YES**, it also translates arcs and circles as polylines with width. Acceptable entries are **YES** (or **Y**), **NO** (or **N**).

THE CGM.CFG FILE

The CGM.CFG file is for conversion to CALS compatible Computer Graphics CGM format and has only two entries. The setting will generally depend on the requirements of the program in which the file will be used.

Default CGM.CFG File Contents	
Variable	Default Value
Coordinate	=Real
Precision	=32

The terms are explained below.

Coordinate: Valid entries are **Real**, **Integer**. "**Real**" means that coordinates are translated as decimal (floating-point) values. "**Integer**" means that coordinates are translated as fixed integer values.

Precision: Specifies the word size in bits. If Coordinate is set to "Real", valid entries are **32**, **64**. If Coordinate is set to "Integer," valid entries are **16**, **32**. The larger the number of bits, the larger the range possible.

Command-Line Entries

When the program is invoked, the command line must include the input and output file names. Except for RLC input files (which must have the RLC extension), raster file names can have any extensions. The application will auto-detect the input raster file format type from its header. The output format can be indicated either by the extension to the file name or by using the "**-vof**" option.

The command line entries to be used are as follows:

osrc.exe: Required to invoke the program.

filename1: A name or a UNIX pipe is required to designate the input raster file.

filename2: A name or a UNIX pipe is required to designate the output vector file.

-vof <*format*>: optional to designate a vector output format for a file not having a standard extension. Valid formats are IGES (or IGS), DXF, CGM, MTF. Format designations can be typed in upper or lower case.

-cfg <*filename*>: Optional to designate a configuration file to be used instead of the standard OSR.CFG or OSRMAP.CFG file.

The input file entry and output file entry must occur in that order after the program name. Other entries can follow in any order. Separate the option used from the file name or format designation by a space. The file name must be a complete name.

Each command line can initiate only one conversion operation and can contain only one output file. However, standard UNIX pipes can be used; for instance, you may redirect the output file to a translator as in the following example:

osr infile.cg4 -vof dxf | dxf2cvtrans

If any entry in the command line is incomplete or invalid, you will see an error message and the command will be cancelled. You can indicate the path to the input file. If you do not, the program will search for it in the current directory and in the directory of the RasterPath setting in the configuration file being used. The program will also search for the output location to verify that it is valid. If a file of the name you entered already exists there, you will be notified that it has been overwritten.

=== *COPYWRITE CREDITS & DISCLAIMERS* ===

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31/08/2003 Davide Pizzolato - www.xdp.it

- fixed minor bug in ProcessImage when bpp<=8

- better color reduction to less than 16 colors

Index

Active Image
gACTIVE, 98
gINACTIVE, 150
Ambiguous Characters
example, 75
Attaching images
gATTACH, 70
Attaching raster
gATTACH, 58
Auto Convert Threshold
example, 74
Batch raster conversion
gOSR, 163
Burn to raster
See gBURN, gRASTER, 111
Change raster, 61, 118
Character recognition
See Converting, Raster text, 210
Clipping Boundary, 98
Color Images
Reduction to Bitonal, 98
Configuration File
Parameters, 227
Converting
example, 69
Polylines vs. Line/Arc/Circle, 125
Raster text
gTCONVRT, 72, 210
gTRAIN, 217
Raster to vector
gCONVRT, 71, 77
gECONVERT, 142
gVECTOR, 78, 222
Raster to Vector
gCONVRT, 125
gTRACE, 66, 214
Vector to raster
gRASTER, 52, 67, 171
Copying raster
gARRAY, 102
gCOPY, 50, 55, 130
gCUT, 135
gOFFSET, 161
gPASTE, 164
Creating new raster images
gCREATE, 133
Cropping raster
gCROP, 48, 134
Custom Configuration, 234
Cutting and pasting raster
gCUT, 53, 135
gPASTE, 66, 164
Deskewing raster
Auto deskew, 100
gDESKEW, 46, 60, 138
Despeckling
gSPECKL, 48, 202, 204
DPI, 151
Maximum Pixels, 133
Draw order, 141
Drawing raster
gLINE, 156
Editing raster
gACTIVE, 98
Erasing raster
Despeckling
gSPECKL, 48, 202, 204
gCROP, 48, 134
gEDGE, 144
gERASE, 51, 145
gRUB, 66, 186
File Writers, 187

gACTIVE, 98
gADESKEW, 100
gARRAY, 102
gATTACH
example, 58, 70
gBURN, 111
gCHANGE, 118
example, 61
gCONVRT, 125
example, 71, 77
gCOPY, 130
example, 50, 55
gCREATE, 133
gCROP, 134
example, 48
gCUT, 135
example, 53
gDESKEW, 138
example, 46, 60
gECONVRT, 142
gEDGE, 144
gERASE, 145
example, 51
gHELP, 147
gINACTIVE, 150
gINFO, 151
example, 59
gINVERT, 153
gLINE, 156
gMIRROR, 157
gMOVE, 158
example, 56
gOFFSET, 161
gOSR, 163
gPASTE, 164
example, 53, 54, 66
gRASTER, 171
example, 52, 67
gREFLCT, 177, 179, 192
gRESIZE, 181
gROTATE, 182
example, 56
gRUB, 186
example, 66
gSAVE, 187
gSCALE, 189
example, 52
gSMOOTH, 198
gSPECKL, 202, 204
example, 48
gTCONFIG
example, 72
gTCONVRT
example, 72
gTRACE, 214
example, 66
gTRAIN, 217
gTURN, 221
example, 58
GTXRAST.CFG, 227
gVECTOR, 222
example, 78
gWARP, 224
Help
gHELP, 147
ICR files, 74
ICR Plus, 217
Intelligent Object Picking. See IOP, 93
Inverting raster images
gINVERT, 153
IOP
Add, 94
ALL, 94
ARc, 94
CIrcle, 94
CRossing, 94
Fence, 94
Inside, 94
Line, 94
Object, 94
PCrossing, 94
PInside, 94
PRevious, 94
PWindow, 94

Remove, 94
Segment, 94
TEXTLine, 94
TEXTWindow, 94
unDer, 94
Undo, 94
View, 94
Window, 94
Linetypes
Dashed
example, 77
Loading raster
gATTACH, 58, 70
gPASTE, 66, 164
Mirroring raster
gMIRROR, 157
gREFLECT, 177, 179, 192
Moving raster
gMOVE, 56, 158
Negative images
gINVERT, 153
NetWare, 22, 240
Novell, 22, 240
Offsetting raster
gOFFSET, 161
OPEN, 68
OSR, 163
Pasting raster
gPASTE, 53, 54, 66, 164
perpendicular, 95
QUIT, 68
Raster files
Formats, 242, 247
Information
gINFO, 59, 151
Raster Files
Limits, 151
Raster Formats
Saving, 187
Raster limits
gRESIZE, 181
Raster selection
See IOP, 62
Raster snap
tangent, 95
Raster snaps, 95
center, 95
edge, 95
end, 95
example, 65
intersection, 95
List, 95
mid-arc, 95
midpoint, 95
near, 95
none, 95
perpendicular to arc, 95
Running, 95
raster-to-vector
parameters, 71
Recognition files, 74
Recognition Files
Training, 217
Reflecting raster
gMIRROR, 157
gREFLECT, 177, 179, 192
Resizing images
gRESIZE, 181
Resolution, 151
Maximum Pixels, 133
Rotating raster, 46
gDESKEW, 60, 138
gROTATE, 56, 182
gTURN, 58, 221
on load, 236
Rubber sheeting
gWARP, 224
Saving raster
AutoCAD SAVE command
SAVE, 50
gCUT, 135
gSAVE, 187
QUIT, 68
Scaling raster

gSCALE, 52, 189
Smoothing raster
gSMOOTH, 198
Snapping
See raster snaps, 95
Speckle removal
gSPECKL, 48, 202, 204
Stretching raster geometry
gCHANGE, 118
Title blocks, 134
Tracing raster with vector
gTRACE, 214
Turning an image
See Rotating raster, 58
Vectorizing raster
See Converting, Raster to vector, 71
Warping raster
gWARP, 224